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Ford Rubber Plantation

NEARLY 600 miles up the storied Amazon, in the heart of a "green hell" teeming with tropical creepers, snakes, and beasts, has been sown the seed that may mean the economic re-birth of one of the richest areas in the Western Hemisphere.

Six years ago when Henry Ford announced he would grow Para plantation rubber in its native habitat, the Amazon Valley, the world or such of it as paid any attention at all, smiled and shrugged its shoulders knowingly. It couldn't be done—even hundreds of millions of dollars couldn't fight the impenetrable jungle, loathsome diseases, and native indifference, they said.

But it has been done. The jungle has been pushed back a thousand acres a year; the tangled, towering mass of vegetation has given way to orderly rows of rubber trees; pestilence has been conquered; and a new rubber capital of the world, Boa Vista, only 610 miles inland from the port of Para and only 3,600 miles from New York, is rapidly taking form in modern streets, homes, and factories.

There are still memories of the commanding position Brazil once held in the rubber producing industry and of the great debacle of 1910. For 100 years the Province of Para had been a chief source of the world's rubber supply. In 1908 the high tide was reached when the Amazon Valley including Para and other Brazilian states as well as portions of Venezuela, Colombia, Ecuador, Peru, and Bolivia exported a total of 40,164 tons of rubber.

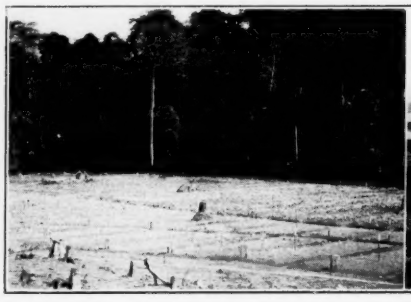
Those were "boom days" equaling anything known in the "gold rushes" of '49 or the hectic, colorful days of the Yukon rush. Money flowed like water in Para, and Manaos which, 865 miles up the Amazon on the Rio Negro was called "the Paris of the West" because of its pomp and gaiety.

The heaviest rubber bearing tree in the world, the *Hevea Brasiliensis,* grew, and still grows wild, waiting for the *caboclos,* laborers who skirted the jungle fringes along the rivers, to gather the latex and by smoking it, prepare balls, slabs, or scraps for export.

Such a haphazard industry was doomed to failure. One of the underlying factors had its beginning years before when an Englishman, Henry Wickham, later knighted for his feat, succeeded in securing some *Hevea Brasiliensis* seeds for experimentation in Kew Gardens.

The crash came in 1910 when, as a result of these experiments, there suddenly appeared in the New York market clean, evenly graded, cheaper Para rubber from scientifically cultivated and operated English and Dutch plantations in Malayasia 13,000 miles from New York. Thus on the ruins of the Brazilian industry was born the British and Dutch monopoly of the world rubber market that was challenged in 1927 when Henry Ford began to plant rubber on the Tapajoz River, a tributary of the Amazon.

What this gigantic Ford project will mean not only to South America in general and Brazil in particular, but to automobile owners throughout the Americas, is easily visioned. Parenthetically it may be noted here that the normal annual needs of the Ford Motor Co. alone call for more than 50,000,000 pounds of rubber in tires and inner tubes, to say nothing of many additional millions used in the manufacture of some 300 car parts, such as composition steering wheels, gaskets, washers, insulation, etc. Even so



Hevea Nursery

Port of Boa Vista

Young Heveas

it has never been suggested that all of the Ford acreage, when finally cleared, will be planted exclusively to rubber trees. For such a plantation of *Hevea Brasiliensis* growing in its native soil would supply many times the amount of rubber consumed by the entire world.

Thus, how much of the tract will ultimately be given over to rubber cultivation has not been determined and will not be until rubber production is well under way. Every acre surveyed, moreover, is ideal for the production of other marketable commodities such as numerous varieties of oil and edible nuts, tropical hard woods, fibers, tropical fruits, cocoa, a high grade of cotton, rice, beans, sugar, and the useful mandioca from which the natives secure tapioca as well as their own national food, farinha meal.

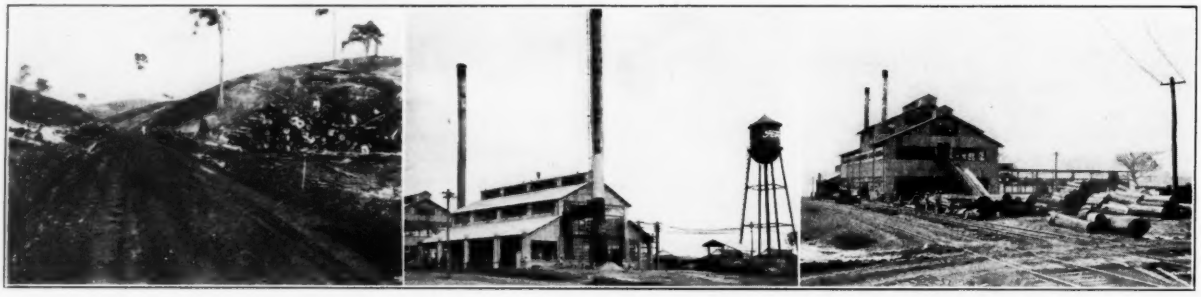
Boa Vista, the highest point in the 75-mile water front of the Ford plantation, was selected for the project's headquarters; and while engineers planned the modern town which is now rising on the site, a crew of natives armed with machetes, the universal weapon and all-purpose tool of Latin-America, was set at work to clear the jungle. As the first crew forced its way in, another and still others followed, felling, logging, and burning until today over 4,200 acres, of which nearly all has been planted with rubber, have been cleared while additional acreage is in preparation.

The power house, a never-ending source of wonder to the natives, is a large steel and concrete building housing 4, 290 h.p. boilers in addition to a battery of generators, a fire pump with a capacity of 1,500 gallons of water a minute, and a refrigerating plant with a capacity of 10 tons daily.

Gradually but rapidly the first hastily built buildings either have been or are being replaced by more modern, substantial, and, in the case of living quarters, more comfortable structures. Typically tropical in style, the buildings are only one-story in height but rest on concrete foundations. The dormitories accommodate 52 unmarried laborers each. The small houses for married men with families number 102, and plans contemplate the ultimate construction of at least 400 of these laborers' houses each accommodating a separate family. In addition there are now 12 houses of 2-family capacity and 11 houses for staff members.

All workers are thus given the benefit of power, light, ice, and—via the most modern of filtration plant equipment —most excellent drinking water. From the Tapajoz River also comes water for shower baths.

The married laborers are encouraged to bring their families to the plantation with them by the offer of a large piece of ground each for a garden plot. In addition there are



Clearing, Logging, Road Making **Power House** **Saw Mill**

Long before the first towering tree came crashing to the ground, the Medical and Sanitary Department had planned a campaign against the ever-present menace of tropical fevers and pestilence. The most modern filtration plant equipment obtainable and supplies for a fully equipped hospital bulked large in the first cargoes freighted to the site direct from Dearborn, Mich., in Ford-owned ships, *Lake Ormoc* and *Lake Fargo*.

Today Boa Vista in the jungle is probably as free from malaria and other tropical scourges as any American city, and the small temporary hospital, one of the first buildings erected, has since been replaced by a 100-bed modern steel and concrete hospital which has the most modern facilities and conveniences known to medical science.

Supplementing the hospital is a constantly intensive prevention program. Rigid weekly physical examinations of all the laborers on the plantation and the enforcement of strict sanitary and dietary codes have contributed immeasurably to the elimination of malaria and that other dread tropical disease, hookworm. As a further preventative, the plantation doctors extend their zone of health supervision to include native habitations in the vicinity of Boa Vista.

As the jungle has receded before the machete and the torch, crushed stone roads and streets have been laid out, approximately 6 miles of railroad built, and a sawmill, originally freighted in pieces from Dearborn, turned the trees felled by the clearing squads into lumber for the first and temporary dormitories, mess-halls, a warehouse, blacksmith and carpenter shops, and homes for officials. A power house and a deep-water dock were among the first tasks of the engineers.

the plantation's well-stocked hog and chicken farms, vegetable gardens, and fruit orchards.

Foreseeing a future plantation population of from 6,000 to 10,000 persons, the engineers very early drew plans for schools for the children of the native laborers and an entire program with ample provision for parks, playgrounds, community recreation halls, and clubhouses, such as are generally regarded as an outstanding example of modern small city planning.

That such planning is no idle dream is vividly instanced by the recent building and opening of the central unit of a handsome school. In its 2 classrooms nearly 200 of Boa Vista's children, ranging from 5 to 16 years of age, are enrolled under the tutelage of the most competent teachers to be found in Brazil. Only a few of these children had had any schooling at all and others but a scant 3 or 4 weeks under teachers who had themselves, in many cases, but little more education than their pupils. Not to be outdone by their offspring, scores of parents avail themselves of the opportunity to study in night classes. A comfortable office for the principal, a spacious lobby, and modern washrooms and toilet facilities are provided. When the growth of Boa Vista warrants, wings are to be added.

A more recent plan has put into operation carefully selected concessionaires who conduct stores for the sale of foodstuffs, clothing, shoes, furniture, and many other articles to the people residing at Boa Vista. All goods sold are inspected as to quality by company representatives. Those employes who, however, prefer to buy their supplies from native boatmen are quite free to patronize the riverside market in the nearby native village.

Native Habitation | Residential View | Laborer's Dwelling

Incidentally, the workman receives the wherewithal to do his buying in wages of real money and not merely, as was too often the case in the past, in the form of slips of paper with an explanation that because his expenses had exceeded his wages, he had nothing coming to him.

It is ultimately the intention to organize a town government composed of officials, police, fire department, etc., with the officials chosen by the workers and residents in free elections in accordance with Brazilian law. The company will maintain only such supervision as may be required to protect its properties.

As to the industrial features of the work being undertaken, there is, for example, the huge building of steel and concrete construction, the first floor of which is occupied by the plantation's machine shop. It is here that many of the small tools used on the plantation are made or kept in condition. On the second floor is a saw mill with a capacity of 90,000 board feet a day. Elsewhere are blacksmith and carpenter shops, dry kilns, a commissary warehouse, etc. The railroad facilitates the movement of the heavier freight and raw materials. It will be gradually extended as the jungle falls back.

Some idea as to what this amazing project means to the immediate territory in which it is situated may be had from the fact that more than $1,000,000 in wages was paid to laborers during 1930. Naturally, too, the undertaking benefits more remote districts. Arriving at the plantation by boat one of the first structures to meet the eye is the receiving building that stands adjacent to the docks. Built in that permanent fashion characteristic of all Ford plantation structures, its steel, concrete, and brick composition measures approximately 65 feet wide by 165 feet long. In this building is maintained a constant stock of supplies valued in excess of $500,000, and these supplies have represented an average monthly expenditure of $57,000 among the merchants of Para. Here, as one inspects bins, shelves, and balconies, or watches the exact dispatch of an overhead electric crane busily engaged in placing or displacing supplies, are seen seemingly every article under the sun. A study of them places even a great emphasis upon the scope of the Boa Vista undertaking. One notes building construction and electrical supplies, machinery and tools of every kind, parts for saw mills, drying kilns, plumbing equipment, furnishings for offices, school, and hospital and other departments, as well as the equipment necessary to the efficient operation of the plantation's railroad, numerous automobiles, tractors, trucks, and boats.

Personnels in the various enterprises, including even high executives wherever possible, are natives of the country in which they are located, and by the establishment of minimum wage scales comparable in every case to the minimum paid by the company in the United States, a valuable contribution to higher standards of living is made.

Prior to the coming of Ford into the Brazilian jungle, the natives pieced out a scanty diet of dried fish, dried meat, and farinha meal with great quantities of *cachaça*, the native rum. Today the high standard of health among the laborers is attributed in large measure to the rule which prohibits employes of the plantation from keeping intoxicants in their quarters and which has substituted vegetables, fresh meats, and wholesome bread for *cachaça* in the native diet.

The average results of established Oriental rubber plantations are about 400 pounds per acre per year. New areas started in Brazil with high grade budgrafts are reasonably expected to produce from 1,500 to 2,000 pounds per acre per year. But there has been found in Brazil very good evidence that seed from the very highest yielding trees have never left the national boundary.

Shortly after the concession was acquired, Mr. Ford dispatched rubber experts and chemists to comb the entire Amazon Valley if necessary to secure the best *Hevea Brasiliensis* seeds. These seeds planted on the then available cleared land near the Boa Vista site provided the first 100,000 young trees for planting. Since then other expeditions into the interior have returned with even better seed and a nursery stock of 1,200,000 seedlings, enough to plant 12,500 acres, is now well on its way.

Hospital | Native Pupils | School House

Molds for Rubber Goods[1]

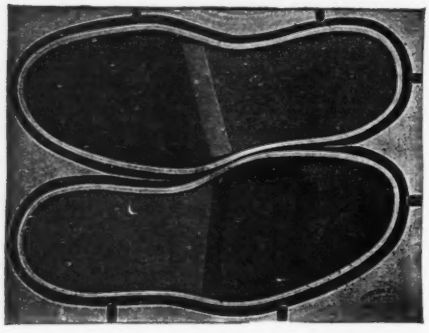
Typical Two-Plate Molds for Soles, Rings, Tubular Articles, Metal Inserted Rubbers, Motor Mountings, Etc.

Webster Norris

AN ENORMOUS assumption on the part of those unfamiliar with rubber working methods is that molded rubber articles receive their form by casting melted rubber in molds. As a matter of fact molded rubber articles are formed by compressing plastic rubber mixings while enclosed in steel or iron molds. When so compressed, the form is made permanent by vulcanization in which heat is conducted to the rubber through the walls of the mold.

Rubber molds are designed differently according as they may be intended for use in a platen press, press vulcanizer, or as a steam jacketed mold. The number of cavities in an ordinary mold for use in a platen press is regulated by the size of the article, the area of the press plate, and the weight of the mold in order to utilize the press facilities to the best advantage.

There is practically no limit of shape in molding rubber whether solid or hollow. The contour of the object to be molded determines the planes of mold separation. In other words how many mold plates will be needed, also what cores if any may be needed. These points are readily determined from a cross-section of the article sketched within a rectangle representing the metal surrounding the mold cavity. Inspection will show where the mold must separate to release the article from the cavity and indicate the extensions of the cavity into each plate of the mold and how many plates will be needed to complete the mold.



The Hoggson & Pettis Mfg. Co.

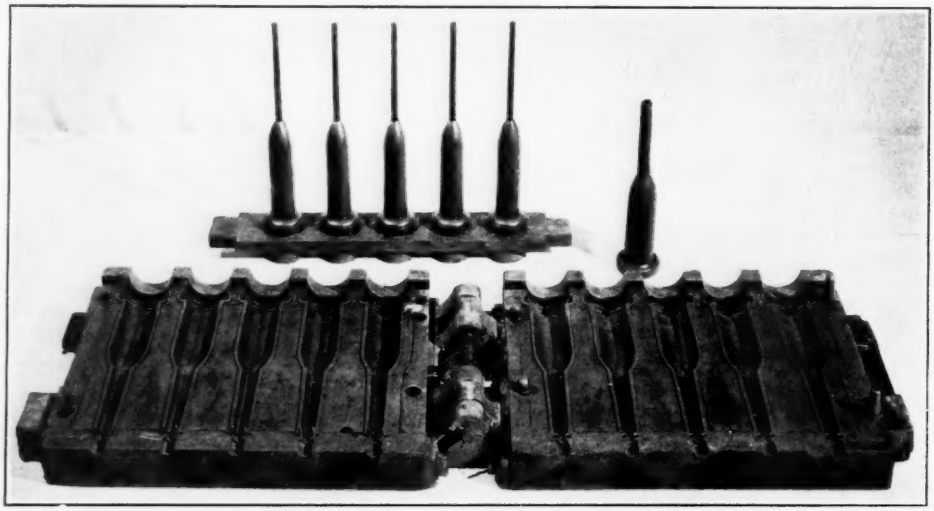
Fig. 1. Mold for 2 Shoe Soles

The use of rubber in automobile construction inclines automotive engineers having scant knowledge of rubber working methods to design unworkable molds. On this point the following quotation taken from a recent article by a leading automobile development engineer[2] is pertinent.

"When designing rubber parts it is important to remember that a cavity must be cut the reverse of the piece to be made, and that the operator must be able to assemble and take apart the mold many times a day, taking the rubber part from it while it is at a temperature of about 300° F., and that whatever thickness and outside dimensions the part has, the mold must be enough larger than the piece to assure mold strength and contact surface with the press.

"Metal inserts, when used, must be completely inclosed in the mold so that the heat will penetrate into the metal as well as the rubber. In metal-insert work, especially where a good bond to the metal is required, it is necessary to design the parts so that there is no flowing of the rubber over the surface of the metal parts. For some reason this flowing of rubber greatly weakens the bond, especially in using brass-plating. Where possible, it is desirable to locate the metal parts by having direct metal contact with parts of the mold and, in the case of round flat parts such as vibration-damper parts, rubber thickness is maintained by permitting the top plate either to rest on the bottom of the mold cavity or on locating lugs of the mold."

The above quotation has particular reference to the manufacture of rubber springs, bumpers, and shock absorbers, the designs of which and the molds for making them should be correlated in the interest of economy with respect both to

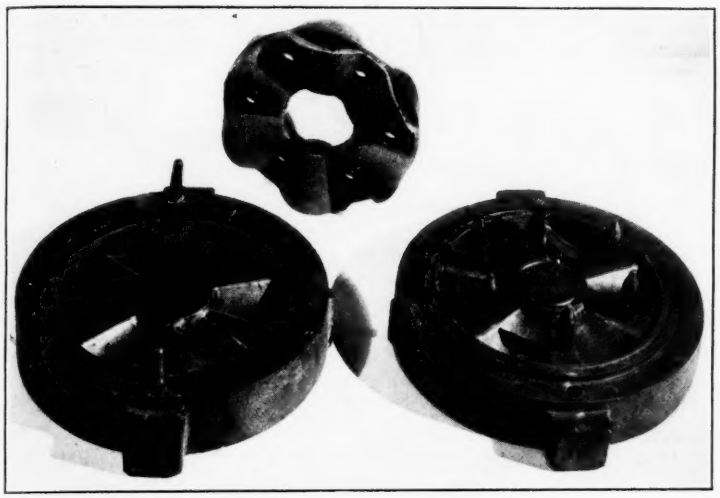


The B. F. Goodrich Co.

Fig. 2. Mold for Milking Machine Inflation

[1]Continued from INDIA RUBBER WORLD, Dec. 1, 1931, pp. 53-54.

[2]"Rubber Problems Confronting Automotive Engineers." R. K. Lee. INDIA RUBBER WORLD, July, 1931, pp. 55-57.

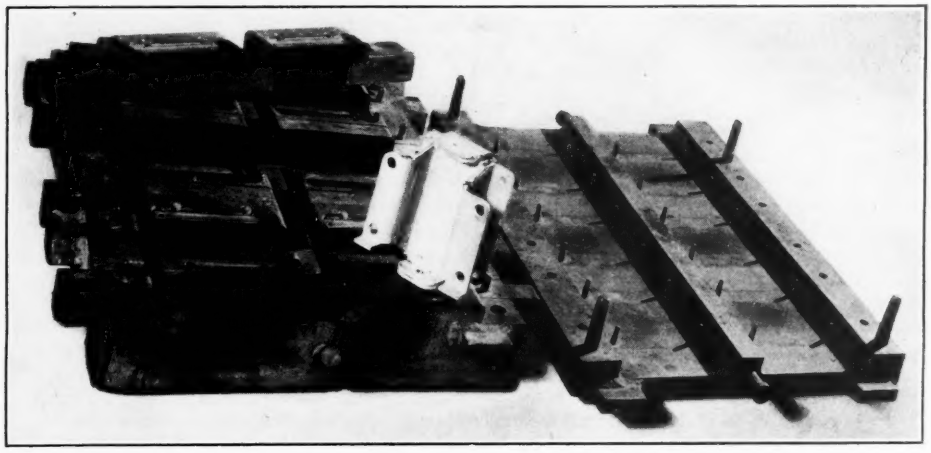


The B. F. Goodrich Co.

Fig. 3. Mold for "Long Life" Universal Joint Disk

making and operating the molds. For example the article should be designed with flat top and bottom surfaces and their edges without curves to secure the least expensive mold.

Having determined the mold type and size for curing a given article in a certain press equipment, the number, the arrangement, and the dimensions of the mold cavities are planned with respect to cavity registration, stock overflow, and shrinkage.



The B. F. Goodrich Co.

Fig. 4. Mold for Rubber Motor Mounting

Registration

Provision must also be made for mold registration, which includes correctly locating and holding all necessary cores, metal insertions, or removable molding pieces required by the shape or the construction of the molded article. Registration is commonly effected by doweling the mold plates together at the time of machining the mold. In a rectangular mold corner dowels are sufficient for registration. In a compound mold many dowels variously distributed and supplemented by ribs fitted to grooves may be needed for proper registration.

Flash Grooves

Rubber blanks are always cut slightly larger in volume than the molding cavity to allow the compression necessary to insure filling the cavity perfectly and making the cured article solid by expelling air from the stock. Provision for the escape of excess stock from the cavity, known as "mold flash," is made by surrounding each cavity with a shallow groove located close to its edges. Usual dimensions of this groove are $\frac{1}{8}$-inch depth by $\frac{1}{4}$-inch width but vary more or less according to the size of the molded object.

Shrinkage

Rubber mixings shrink measurably when vulcanized. Therefore in those instances where the article must conform to prescribed dimensions, the mold cavity is made sufficiently large to compensate for a definite shrinkage dependent on the nature of the stock to be used. The shrinkage allowance for soft rubber varies from $\frac{1}{4}$- to $\frac{5}{16}$-inch per foot; that for hard rubber or ebonite of high quality is $\frac{3}{16}$-inch per foot. These are the allowances commonly prescribed in American practice.

Two-Plate Molds

Two-plate molds vary from flat cavity and cover plates to those provided with cores, and other molding forms of metal, means for locating metal insertions to be retained in the molded article, and for filling metal blanks with molded rubber. Representative molds embodying these features are illustrated and described below. Inner tubes, water bottles, fountain syringe bags, bathing caps, bathing shoes, and many other articles formerly made by hand have been greatly improved by being molded. A 2-plate mold of simplest type is represented in Figure 1. It shows cavities for 2 shoe soles cut wholly in the bottom plate and fitted closely together to conserve space and mold weight. Overflow grooves surround each cavity with branches for venting it from the mold. The cover plate of a sole mold is usually stamped to imprint sizes or other identifying marks on the back of the soles.

A hinged 2-part mold with core for forming 5 tubular pieces used for milking machine inflation is pictured in Figure 2. A sample of the molded rubber is shown at the right of the group of mold cores. The latter are permanently attached to a plate, which registers by dowels at each end when placed in the slot machined at the back edge of the mold. Circular pieces on the back of the core plate fit the semi-circular openings in the rear edge of the mold and serve rigidly to hold in place the individual cores. The flat area or "land" around each cavity is slightly lower than the boundary of the cavities, thus providing space to accommodate mold overflow.

Hinging a mold of this sort not only facilitates its operation by the pressman but permits quick accurate closing while insuring accurate registration of the mold and the cores. The 2-part single cavity mold in Figure 3 is designed to form the peculiar universal joint disk pictured with the mold. The cavity is machined half in each side of the mold. The piece at the right contains 6 pins that register and mold holes required for bolting the finished disk to place in service. The opposite part of the mold is bored to accommodate these 6 pins and has 2 registering dowels

besides. These are placed opposite at the opening lugs of the mold.

The cavity is surrounded by an overflow groove. The mold halves close together with a flange and groove fit which ensures exact registration. The heavy lugs both sides of each piece are for prying apart the mold after a cure.

A 2-plate group or compound mold used for molding rubber into automobile motor mountings is pictured in Figure 4. This is a heavy mold lifted about by fall and tackle attachable to the round lugs centrally located in front and rear edges of body and cover. A blank metal motor mounting piece stands on the mold, central in the figure. The compound feature of this mold comprises a number of cast iron bars, each containing a pair of motor mountings held to their respective locations by dowels at each end. One of these cavity bars is shown in the background at the left on top of the mold and in the rear of its working position. The cover portion of the mold in the right of the figure exhibits the complete layout of dowels and dowel holes placed for locating properly the removable cavity bars. The cover also has a square central ridge and side ridges, which fit into corresponding recesses in the opposite mold half thus effectually preventing endwise movement of the bars.

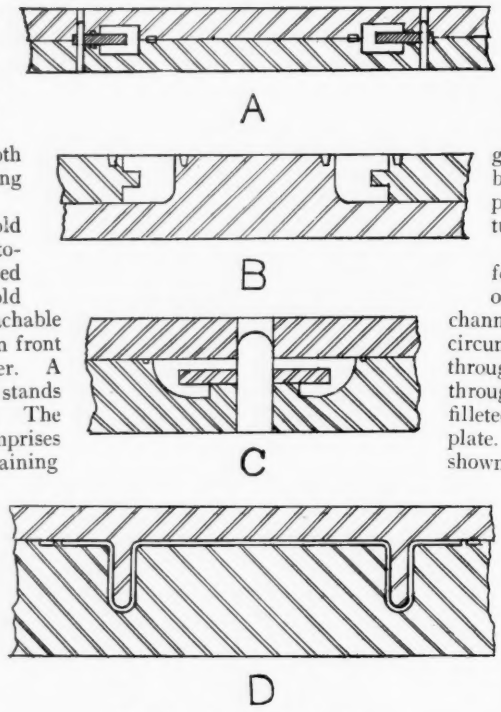


Fig. 5. Two-Plate Cavities

Cross-sections of typical 2-plate mold cavities are grouped in Figure 5. Sketch *A* shows the cavity provided for molding a semi-circle having an external channel. Half of the cavity is cut in each plate; while the channeled outer edge of the half ring is formed by a removable semi-circle of steel. The upper and the lower mold plates and the channel forming piece are registered by dowels fastened in the bottom plate, passing through the channel ring and entering the top plate. Flash grooves are cut around the cavity in both plates. The channel molding piece is taken from the mold and returned with each molding.

Sketch *B* represents a mold cavity for a complete ring with channeled outside edge. In this example the channel is molded by a rib turned on the circumference of a circular opening bored through the top plate; while the hole through the molded ring is formed by a filleted boss or plug turned on the lower plate. The registering dowels are not shown in this illustration.

Sketch *C* indicates a cavity for molding a rubber covered washer flat on one side and curved on the other. The hole through the rubber on the flat side coincides with that through the metal washer within but is larger on the opposite or curved side. The mold cavity is entirely within the lower plate. The upper plate serves as a cover and is bored to receive the dowel that registers the mold and centralizes the metal insert. The flash groove around the cavity is cut only in the lower plate.

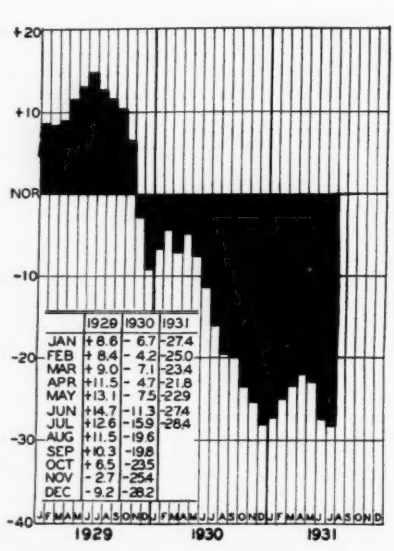
Sketch *D* shows a 2-plate cavity for a flat diaphragm with a deep hollow rib on one side. The rib cavity is sunk into the heavy lower plate, and the hollow form of the rib is molded by a corresponding filleted base ring turned on the upper plate. The registering dowels are not shown. The flash groove encircles the cavity in the lower plate.

Industrial Activity

1929-30-31

PROBABLY the most reliable index of business activity in this country is the volume of industrial production as reported in the data compiled by the Federal Reserve Board. The index used by this bank consists of those figures recomputed so as to show the percentages by which the monthly production data exceed the computed normal level, or fall below it. The record for the past 3 years is shown in the diagram and table herewith.

The high point of prosperity was reached in June, 1929, at a level of 14.7 per cent above normal. The decline to December was rapid, but then came a period of recovery, and a sideways movement lasting to the Summer of 1930. This may reflect the stimulus to business following the conferences called by the President, and resulting from the cooperation elicited by them. In the second half of last year the decline was unbroken, but a new advance occurred in the early months of this year. This may have been occasioned in part by the expenditure of the large amounts of money disbursed in the bonus payments. Since last April a new decline has set in. The record of each succeeding month has been lower than that of the one before, and the July figure is a new low for the depression. It seems probable that August will be lower yet. Cleveland Trust Co., *Business Bulletin.*



	1929	1930	1931
JAN	+8.6	- 6.7	-27.4
FEB	+ 8.4	- 4.2	-25.0
MAR	+ 9.0	- 7.1	-23.4
APR	+11.5	- 4.7	-21.8
MAY	+13.1	- 7.5	-22.9
JUN	+14.7	-11.3	-27.4
JUL	+12.6	-15.9	-28.4
AUG	+11.5	-19.6	
SEP	+10.3	-19.8	
OCT	+ 6.5	-23.5	
NOV	- 2.7	-25.4	
DEC	- 9.2	-28.2	

FROZEN ASSETS AS REPRESENTED BY the real estate situation by deposits in closed banks, and by loans on securities not readily liquidated have largely prevented business recovery.

New Welding Code and the Rubber Industry

F. G. Sherbondy[1]

The acceptance of the new A.S.M.E. Welding Code by the State of Ohio on December 9, 1931, makes the construction of vulcanizers, devulcanizers, and pressure tanks of utmost importance to the rubber industry in that state.

THE advance that has taken place in the art of fusion welding in the last few years has probably never been paralleled by a similar development so materially affecting recognized and accepted practices of long standing. The universal approval accorded fusion welded construction, after what may seem a relatively short period of research and development, is due chiefly to the following factors:

1. There has been a genuine need of a method of constructing various types of retorts, vessels, etc., of a superior nature to the type previously available. Consequently the advantages of welded construction were quickly recognized by industries in general as a means of effectively and more economically carrying out many advanced processing requirements.

2. The various fabricators of special steel and alloy plate construction solved, with thoroughness, the problem of producing welded joints of predetermined uniformity and strength.

3. Insurance companies, societies, boards, and committees interested in the project cooperated in unifying the many individual methods of welding practice into a universal code acceptable and approved by the various interests concerned.

Rules for the construction of unfired pressure vessels as adopted by the A.S.M.E. Code Committee, July 7, 1931, places the stamp of approval of the highest engineering authorities on welded construction and effects a universal recognition of this method without commercial limitations.

It is to be expected that the 1931 code, permitting as it does the construction without limitation of any type of pressure vessel, may present problems of classification and interpretation that are not always understood by the management of industries in general. Likewise, being the result of research and data supplied from so many different sources, it may contain conditions which, when combined under a uniform procedure, are likely to be misunderstood and misapplied.

The industrial engineer, preparing specifications for the construction of welded vessels, as well as the management of industry, should note that the classification of the accepted methods of welding in the 1931 code, under Classes 1, 2, and 3, should be considered solely as *"a method of describing the recognized and accepted practices for welded construction"* and *not* as a means of qualifying or grading respective types or methods of welding as to what might appear to be their superiority one over the other. For example, certain types of vessels, or to be more exact, vessels of certain dimensions and for certain working conditions and pressures, are to be built under rules applying to Class 1; certain other types of vessels are to be built in conformity with rules for Class 2, and certain other types are to be built in conformity with rules for Class 3. These requirements of the code and the various classifications are the result of painstaking research, countless tests, and a collection of data covering the entire subject of welded vessel construction. From such efforts a uniform code and the classifications referred to have been developed, with the result that *each class is distinctly within itself and is the accepted and recognized standard* for construction of the particular type and kind of vessel which comes within each respective class.

There may be some process engineers who would unwittingly place a capital burden on the management by not thoroughly analyzing the full meaning of the new code and by arbitrarily specifying a construction entirely unnecessary for the particular type of vessels under consideration. This error would not be made by engineers who are thoroughly conversant with welded construction and the details of code requirements.

Stress relieving, for example, was the subject of much discussion by the Code Committee. However it is sufficient to say that if a theory exists that stress relieving is a "cure-all" for all welding ills, it is very much overrated and its benefits are very much misunderstood.

Stress relieving or the construction of vessels that are free from measurable or objectionable stresses is a very important factor, comparable with ductility, uniformity, and strength. However the specifications applying to stress relieving for Class 1 vessels, as well as their application, to a limited extent, to Class 2 vessels, is the result of a compromise from the original thoughts on the subject, the *compromise* being possibly effected by the favorable experience records of the products of certain welding procedures, wherein thermal stress relieving was *not* employed. The State of Ohio, in accepting the A.S.M.E. Code applying to welded unfired pressure vessels, reserved the right to modify this and other code regulations as explained later.

Thermal stress relieving, as required by the code, does not nor was its function ever intended to improve the tensile strength, ductility, or soundness of the weld. Its application in the code is due largely to a broad interpretation of welding and to the fact that individual ability or procedure cannot be recognized. Stress relieving on vessels of extremely heavy wall thickness (in excess of 1½ inches) is undoubtedly good practice and possibly an essential requirement.

The code permits, however, the construction of many types of welded pressure vessels, without annealing or stress relieving, where the operating pressure is not in excess of 400 pounds or the operating temperature is not in excess of 700° F., the maximum plate thickness being limited to 1½ inches. But on small diameter vessels of heavy wall thickness, where the ratio of the diameter to the cube of the

[1]Member of American Welding Society and vice president of The Biggs Boiler Works Co., Akron, O.

shell thickness is less than 100, stress relieving is required.

There exists in my mind, however, some doubt as to the necessity of annealing or thermal stress relieving any vessel, except possibly for Class 1 service, when constructed of plates up to 1½ inches in thickness especially in diameters 42 inches and larger.

Our company has constructed various vulcanizers, devulcanizers, and other vessels for the rubber industry, and their continuous and satisfactory performance of approximately 3 years has demonstrated the correctness of my contention, which has been shared by leading insurance companies who have accepted such vessels for insurance prior to the time that the code recognized welded construction, other than in a limited degree.

Unfortunately the code cannot recognize individual processes, and I fully realize, on the other hand, that it is possible by some procedures, as well as by inexperience, to lock up objectionable stresses that must be relieved.

In my opinion, therefore, the rules as adopted by the code are entirely justifiable, but in no case should thermal stress relieving be considered necessary in *excess* of the code requirements, and, when resorted to, such vessels should *not be considered* superior to those wherein the welding procedure itself is so controlled that it obviates the necessity of annealing or thermal stress relieving.

That this opinion is shared by others thoroughly familiar with the subject is evidenced by the fact that the Ohio Board of Boiler Rules, when accepting the A. S. M. E. Code on December 9, 1931, accepted the code as written, but in doing so passed the following resolution:

"U-23. When a person or persons desires to manufacture a fusion welded pressure vessel with a method which does not comply with Class 1, Class 2, or Class 3 fusion welding rules set forth in this Code, shall submit drawing and specifications to the Industrial Commission of Ohio and conduct such tests as said Industrial Commission may require, who may then permit the stamping of such vessels Ohio Standard and the Installation of them in the State of Ohio."

Such action taken by a state, board, or individual in no way detracts from the value of the code but does permit the recognition of individual ability and procedures where such procedures have been established and the results definitely known.

Notwithstanding the strides already made in welded construction, it is still in its infancy and should not be unduly handicapped by improper application of fundamentals. Welded construction has definitely proved superior to other types of construction. While in some instances welded vessels may be slightly lower in initial cost because of saving material, the correct attitude regarding this construction concerns the ultimate saving effected owing to decreased maintenance, general utility, and prevention of loss in production due to repairs. These items certainly favor welded construction irrespective of its first cost.

Manufacture of DuPrene

THE announcement early in December[1] that a practical method of making synthetic rubber has been discovered created much interest as to the steps in the process and the properties of the product. These, as far as stated in the patent[2], are recorded below.

To 100 parts of divinylacetylene obtained by the polymerization of acetylene there are added 200 parts of water, 2 parts of naphthenic acid sodium salts, and 1 part of gelatin. The mixture is agitated violently until it is found upon miscroscopic examination that the average particle size is 1 micron and that disproportionably large or small particles are chiefly absent. With this emulsion there is then mixed 1 part of guayule resin in the form of an aqueous suspension. The mixture is then allowed to stand for 7 days at room temperature (25° C.) to polymerize, and there is then added 1 part of Hevea latex, which is thoroughly incorporated by gentle agitation. Two-tenths of a part of hydroquinone in the form of an aqueous solution are added. The mixture is then coagulated by the addition of sufficient 2 per cent acetic acid to change the pH of the solution to approximately 4. The coagulum thus obtained is freed from water by milling and is ready for use as raw rubber.

The finished product may be treated in the same general manner as raw natural rubber. It may be milled, the usual chemicals such as zinc oxide, sulphur, accelerators, carbon black, softeners, antioxidants, etc., incorporated. It can be cured, or vulcanized, by heat treatment applied in a manner similar to that used in curing natural rubber. It can also be cured with sulphur chloride, or, in general, by the methods and reagents used for natural rubber.

Examples of Vulcanization

The "synthetic divinylacetylene rubber" is broken down on the mill in the same manner as, for example, pale crepe rubber. To 100 parts of the dry "rubber" are added 5 parts zinc oxide, 5 parts sulphur, 0.5-part morpholyl morpholine dithionate, and 1.0 part phenyl-a-naphthylamine, and the whole thoroughly milled. The resulting product is then cured 3 minutes at 140° C. There results an elastic body, possessing good tensile strength and elongation.

The synthetic rubber is treated with a carbon disulphide solution of sulphur chloride in the usual cold cure manner. Rapid but superficial curing takes place.

Distinguishing Characteristics

The material produced by this process can be readily distinguished from previously prepared synthetic rubbers by the fact that the diffraction pattern, obtained upon taking an X-ray photograph of the stretched material, is closely similar to that obtained from natural rubber, and is that ordinarily considered characteristic of the crystalline body; whereas the corresponding photographs of other synthetic rubbers are characteristic of an amorphous body. This diffraction pattern is not necessarily indicative of a crystalline substance, but only of a substance in which the molecules possess definite orientation although it has been commonly accepted in the past as evidence of crystallinity.

The fundamental property common to all of the products made according to the procedure described is that of elasticity to a marked degree; elongations of up to 800 per cent have been obtained. The tensile strength varies with the precise mode of preparation, the hydrocarbon or hydrocarbons used, and the degree of polymerization. The other properties can also be varied widely by varying the factors just mentioned.

The materials prepared in accordance with the above description may be used as general substitutes for natural latex and natural rubber.

[1] India Rubber World. Dec. 1, 1931, pp. 55-56.
[2] U. S. Patent No. 1,829,502, Oct. 27, 1931.

Rubber Manufacturers' Dinner

THE Thirty-second Annual Dinner of the Rubber Manufacturers Association, Inc., 250 W. 57th St., New York, N. Y., was held in the Roof Ballroom of the Hotel Waldorf-Astoria, New York, N. Y., on the evening of January 11, 1932. Four hundred members and guests attended.

The entertainment for the affair was varied and well chosen. It included an interesting talk by John B. Kennedy, associate editor, *Collier's Weekly;* a political speech by the Hon. L. J. Dickinson, United States Senator from Iowa; a song program by Alan Jones; and dinner music by The Waldorf-Astoria Orchestra. James D. Tew, president of the association and of The B. F. Goodrich Co., served as toastmaster and delivered the opening address.

James D. Tew, President

F. B. Davis, Jr., First Vice President

C. D. Garretson, Second Vice President

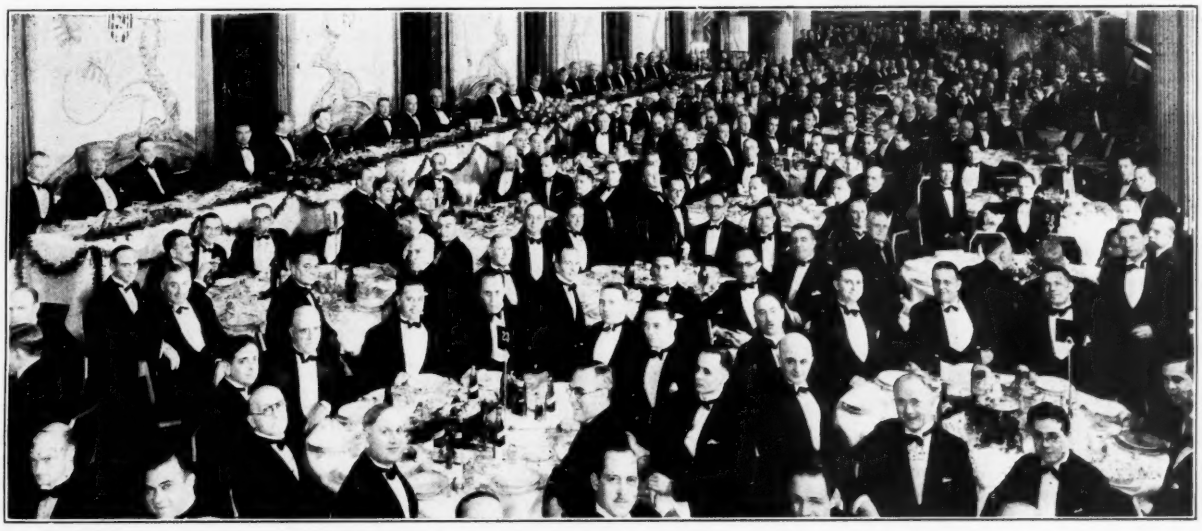
Mr. Kennedy, in his entertaining discussion replete with anecdotes of several sport celebrities including Dempsey, Rockne, and Ruth, of Dr. Eliot, and even an inmate of Sing Sing, maintained that the "spiritual does abide in the most materialistic aspects of an essentially commercial civilization," and that "In business civilization, no matter where we examine it, if we reach the heights or go down to the depths, we find the essential thing that the French have a better word for than we have called esprit, the spirit that survives even the most materialistic circumstances."

Senator Dickinson attributed present business conditions to overexpansion. But he thinks that the nation's "headache," resulting from such a practice and its attendant ills, would not last much longer. To hasten the return to normalcy, the Senator from Iowa recommended protective tariffs, the Reconstruction Corporation Bill, the relinquishing of frozen assets, and the acceptance and the utilization of the services of the Federal Reserve System in the extension of credit. He advised business in this country to be satisfied with its domestic market until that had adjusted itself; then make a bid for the world market. In regard to foreign debts, the Senator suggested that those nations reduce armaments to lessen the possibilities of war and he was sure, then, that the United States would help its debtors. America, however, must reorganize herself and rebuild at home first. Mr. Dickinson firmly believes that if this country maintains a safe, sane, single standard of money, soon we shall see the return of normal conditions to the benefit of all concerned.

Address by President Tew

"It has been customary at each one of these annual dinners for the president of this association to make some remarks. Before I go any further, I want to make it clear that whatever I have to say is not going to be of a pessimistic nature.

"While it is true that the year 1931 has not been for most of us one that we are going to look back to with a good deal of pleasure, I cannot help but feel that conditions



Drucker & Baltes

have done a great deal to bring about a greater spirit of cooperation among the members of this industry. In times of stress that is, at least, one compensation for the very disadvantages we have faced.

"It is true, however, if I may say it, and it is my own opinion, at least, that we still have too much of an idea of volume and too little of an idea of profits.

"Ex-Governor Cox, of Ohio, addressed the Jackson Day Dinner in Washington the other night and made a very apt remark in which he said, 'It is impossible to get gold eggs unless you have a healthy goose.'

"I think that applies to all industries. I do believe, however, that the rubber industry has fallen heir to more than unjustified criticism. I don't think there is any other industry which has had the tremendous fluctuations of raw material which we have faced, when we consider that our chief raw material today is worth less than 1/20 of what it was six years ago. I think that, at least, must be taken into account before criticisms are made.

"I have very little doubt in my own mind but what we are practically at the bottom so far as raw materials, at least rubber, is concerned. We at least have the satisfaction of knowing exactly how much the maximum write-down can be, if we face it in the near future, which will be nothing to what it has been in the past; but I do believe that there are more than good probabilities of seeing some action taken on the part of those producing rubber, either in the shape of restriction or a tax, or both, in the very near future; and if such action is taken, there is a possibility that before this year is out, we will have a very appreciable increase in the price of our raw material.

"If that takes place, I feel confident that there is no one in this room who would not welcome 10- to 12-cent rubber; and I hope that in case we do face that, we will show sufficiently good business judgment to correspondingly increase the price of our materials. I think we will all agree that there is no stimulus which would be of more benefit to all of us than an increase in the selling price of our products.

"With that, and a firm conviction that we are the trustees of other people's money, and that our chief duty is in earning a fair return on a fair invested capital in an efficient organization, I shall look forward to 1932 with optimism."

Annual Meeting

At the seventeenth annual meeting of the R. M. A. held in the Assembly Rooms of the Waldorf-Astoria, Monday morning, January 11, all the officers of the 1931 administration were elected. Their names and their affiliations are as follows:

President, J. D. Tew, president, The B. F. Goodrich Co.; First Vice President, F. B. Davis, Jr., president, United States Rubber Co.; Second Vice President, C. D. Garretson, president, Electric Hose & Rubber Co.; General Manager, A. L. Viles; Treasurer, H. B. Delapierre, Kelly-Springfield Tire Co.; Assistant Secretaries, George Flint, R. H. Goebel, C. W. Halligan, and A. C. Grimley. Charles Neave is counsel.

The directorate consists of: E. S. Boyer, American Hard Rubber Co.; E. H. Broadwell, Fisk Rubber Co.; F. B. Davis, Jr.; G. B. Dryden, Dryden Rubber Co.; C. D. Garretson; E. B. Germain, Dunlop Tire & Rubber Corp.; W. H. Lalley, Kelly-Springfield Tire Co.; J. A. Lambert, Acme Rubber Mfg. Co.; A. B. Newhall, Hood Rubber Co.; Wm. O'Neil, General Tire & Rubber Co.; C. Slusser, Goodyear Tire & Rubber Co.; Herbert E. Smith, United States Rubber Co.; J. D. Tew; A. F. Townsend, Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.; W. S. Wolfe, Seiberling Rubber Co.

Rubber Industry Manufacturing Costs and Sales

IN THIS time of intensive study into costs of materials, processing, and distribution that is occurring on every hand, it is instructive to compare the statistical results for the rubber industry with those in other manufacturing lines.

The approximate total consumption of crude and reclaimed rubber, compounding materials, fabric, and wire amounts to 1,267,857 long tons. The items of this total are indicated in Table I together with their statistical origin or estimation.

Accelerator consumption is figured at 1 per cent on the weight of crude rubber plus the same percentage on the rubber hydrocarbon in reclaim which is averaged at 40 per cent. Antioxidant consumption is taken at ½ that of accelerators; while stearic acid consumption is calculated as 2 per cent of the crude rubber consumption. Bead wire runs 200 pounds to 120 tires, according to reclaimers' experience.

TABLE 1.

Annual Consumption of Materials by the Rubber Industry in the United States

	Long Tons
Crude rubber	517,553*
Reclaimed rubber	230,822*
Carbon black	84,444*
Zinc oxide	66,838*
Sulphur	30,648*
Tire fabrics	140,029*
Hose and belting duck	17,168*
Other cotton fabrics	35,077*
Lithopone	7,176†
Litharge	6,651†
Basic lead sulphate	655†
Kaolin (clay)	34,296†
Accelerators	6,000‡
Antioxidants	3,000‡
Stearic acid	10,000‡
Wire (tire beads)	30,000‡
Wire (hose)	5,000‡
Rosin	2,500‡
Caustic soda	40,000¶
Total	1,267,857

*U. S. Census of Manufactures. †Bureau of Mines. ‡India Rubber World. ¶Chem. & Met. Eng.

Mechanical Rubber Goods

Commodity costs of mechanical rubber goods on the basis of percentage of dollar sales compares as shown in Table II with the corresponding average costs of 20 other manufactured products of other lines.

TABLE 2.

	Material %	Labor %	Distribution, Overhead, and Profit %
Mechanical rubber goods*	46.1	8.5	45.4
Average of 20 other fields of manufacture	43.7	15.4	40.9

* Carle M. Bigelow in *Factory & Industrial Management*, Jan., 1932.

Tires

The factory percentage cost of tires has been analyzed as follows: cotton fabrics, 23; crude and reclaimed rubber, 16.8; compounding ingredients, 7.3; wire, 2; labor and overhead, 50.9.

Rubber Goods Sales

The United States Census of Distribution shows the following items on the total dollar sales of rubber tires and tubes and rubber boots and shoes and percentage subdivisions of these sales as to the channels through which they were made.

Tire and tube sales value $770,200,000. Percentage subdivisions are: sales to company owned branches, wholesale 48.5, retail 0.5; sales to dealers, wholesale 8.2, retail 17; sales to consumers, industrial 25.6, household 0.2.

Patentable Inventions

In the Rubber Industry

Joseph Rossman, Ph.D.

THE following is a continuation of the interesting and useful data on patenting inventions for the rubber industry, begun in the January 1, 1932, issue of INDIA RUBBER WORLD.

Definition of "Manufacture"

The term "manufacture" in patent law is a thing made. In other words it includes all products made by a process or machine. The term "manufacture" embraces any manufactured article which does not fall within the classes previously mentioned. For example, a golf ball, a vulcanizing mold, a rubber sponge, a tire or inner tube are articles of manufacture. The expression "article of manufacture" covers anything made from raw materials by the hands, apparatus, or operations by man.

It has been repeatedly held that the product of a process or machine is patentable, if novel, without regard to its method of manufacture.

"Improvement" Defined

The patent law includes an "improvement" as a distinct class of invention. This term is used in its ordinary sense meaning any change, modification, or addition to a known process, machine, composition of matter, or article of manufacture. As a matter of fact most inventions are improvements, and usually no sharp line of distinction exists between an "improvement" and the other statutary classes of invention previously discussed.

Certain Types of Living Plants Patentable

In accordance with a recent amendment to the patent laws patents can be obtained for new and distinct varieties of plants, other than tuber-propagated, provided they can be asexually reproduced. Several patents for new plants have already been granted. This provision in the law may be of importance to rubber growers who develop by hybridization new varieties of plants which are disease resistant, produce a larger yield of rubber or have other desirable characteristics. A plant patent gives the owner the exclusive right to propagate his new plant by asexual methods such as by grafting, budding, or cuttings. The law thus gives the plant breeder a complete monopoly for any new plants which he may develop. No other country in the world gives similar protection to plant breeders.

Abstract Principles Not Patentable

It should be remembered that abstract principles in laws of nature are not patentable. They are only patentable when embodied in some practical method of utilizing them. Likewise an effect, end, or result accomplished by a method or device is not patentable. Only the effective means or method of producing the desired result can be patented.

It is also obvious that mere ideas, mental theories, plans of procedure, a natural force, scientific law or generalization, a new chemical principle, an idea, a law of nature even if newly discovered cannot be patented unless they are put to some practical use in the form of a process or apparatus.

What Is Invention?

Before any one can obtain a patent he must convince the Patent Office that he has made (1) an invention, (2) that it is novel, and (3) that it is useful. At the outset it may be frankly stated that no one has yet been successful in defining the term "invention" although the Patent Office and the courts use the term as if it were a very definite or tangible thing.

The Supreme Court has said: "The truth is the word cannot be defined in such manner as to afford any substantial aid in determining whether a particular device involves an exercise of the inventive faculty or not. In a given case we may be able to say that there is present invention of a very high order. In another we can see that there is lacking that impalpable something which distinguishes invention from simple mechanical skill. Courts, adopting fixed principles as a guide, have by a process of exclusion determined that certain variations in old devices do or do not involve invention; but whether the variation relied upon in a particular case is anything more than ordinary mechanical skill is a question which cannot be answered by applying the test of any general definition." (McClain v. Ortmayer, 141 U. S. 419.)

It may be broadly stated that the exercise of the ordinary mechanical or chemical skill of a rubber technologist in producing an expected result is not patentable.

It may be asked: How can the rubber technologist determine whether a new apparatus, process, or compound which he has developed or made will be regarded as an invention by the Patent Office or the courts? There is no simple positive test which can be applied. The best that can be done is to answer the question by subjecting the invention to a series of negative tests or rules which have been developed during many years of patent procedure and litigation. These rules of invention will now be explained with illustrations from actual cases.

In determining whether invention is present, "the prior state of the art" or the accumulated store of knowledge must be taken into consideration, for invention is, after all, a relative term. The importance or the extent of an invention can be determined only by what has been known before the time of the invention.

According to Walker, an authority on patent law: "To be a patentable invention there must be present a creative mental conception as distinguished from the ordinary faculties of reasoning upon materials supplied by a special knowledge, and the facility of manipulation which results from its habitual and intelligent practice by those skilled in the art."

Machine Inventions

Most inventions for machines consist in new combinations of old and well-known means. The general rule is that *the exercise of ordinary mechanical skill is not invention.* Mechanical superiority alone is not patentable. The following are not ordinarily patentable: a change in size, proportion, form, arrangement, or location of parts; merely

bringing together old devices, duplication or reversal of parts, omission of parts with their corresponding function, making parts integral or separate, making device portable, reversal of movement. But if any of these changes gives a new, unforeseen, and useful result, or a new mode of operation, then invention may be present.

Invention in an apparatus may reside in utilizing new means although the result obtained in using the apparatus is old. Invention may consist of the use of old means in a new way whereby new functions are performed or new results produced. Any change may involve invention if it leads to an unobvious or unusual and highly desirable result which could not be foreseen or predicted, thus producing a new mode of operation or effect previously unknown. A combination of old parts is not patentable unless a new mode of operation is introduced which was not known before; but a more convenient assemblage of devices, each performing its own separate function independent of the others, is considered to be merely an aggregation and therefore not patentable. The assembly of separate units into an organized whole is not patentable if it merely requires ordinary and expected skill to do so. A combination of old parts, in other words, in order to be patentable must not only produce a new and useful result but must not be such as is obvious to the mechanic.

Typical examples of mechanical skill are the following cases actually decided by the courts as not involving invention: a pointed set screw to prevent slippage between two surfaces; scallops or indentations in the inner edge of a steering wheel; a stop to prevent the movement beyond a certain point; a belt or friction gear substitute for cogwheels; placing reenforcing material in concrete; inclosing parts with a casing having a transparent window; mere change of shape of molds; use of insulation to prevent electrical short-circuits; making parts detachable.

Mechanical Skill Is Not Invention

The courts have repeatedly held that to produce a device or process which any skillful mechanic or chemist would produce whenever required is not invention. Thus the Supreme Court has said:

"The process of development in manufactures creates a constant demand for new appliances, which the skill of ordinary head workmen and engineers is generally adequate to devise, and which, indeed, are the natural and proper outgrowth of such development. Each step forward prepares the way for the next, and each is usually taken by spontaneous trials and attempts in a hundred different places. To grant to a single party a monopoly of every slight advance made, except where the exercise of invention somewhat above ordinary mechanical or engineering skill is distinctly shown, is unjust in principle, and injurious in its consequences. The design of the patent laws is to reward those who make some substantial discovery or invention which adds to our knowledge and makes a step in advance in the useful arts." (Atlantic Works v. Brady, 107 U. S. 199.)

In another case the Supreme Court has said: "It is often difficult to determine whether a given improvement is a mere mechanical advance, or the result of the exercise of the creative faculty amounting to a meritorious invention. The fact that the invention seems simple after it is made does not determine the question; if this were the rule many of the most beneficial patents would be stricken down. It may be safely said that if those skilled in the mechanical arts are working in a given field and have failed after repeated efforts to discover a certain new and useful improvement, that he who first makes the discovery has done more than make the obvious improvement which would suggest itself to a mechanic skilled in the art, and is entitled to protection as an inventor." (Expanded Metal Co. v. Bradford, 214, U. S. 366.)

Aggregation and Combination

Aggregations of machine elements, steps in procedure, or ingredients of a composition are not patentable. An aggregation may be defined as the mere bringing together of separate elements (whether they be a machine element, some material, or ingredient or step in a process) without changing the functions performed by them, or producing any result other than the added result of the separate elements. In other words, where the final result is only the additive result of the elements, nothing new is achieved; but where they coact to produce a new and unitary organization or procedure producing a different result from that produced by their separate operation, we have a true patentable combination.

The elements of a patentable combination must not necessarily be new. It is only necessary that they be combined so as to give a new and useful result. The combination is really distinct from its elements, and any new elements may be protected separately. All the elements must not necessarily act simultaneously. A joint operation to produce a unitary result is sufficient.

In a recent decision the court said: "In determining whether or not the combination of elements . . . is patentable we must be governed by two well-defined principles of law: (1) where each element in the combination performs its function unaffected and unmodified by the action of the others, if there is no coaction of these elements with one another and if their combined result is the result of each element performing its function in its own way, unmodified by the others—each element contributing its share to the work—then such combination is a mere aggregation and is unpatentable . . . . (2) It is not requisite to the patentability of a combination of old mechanical elements that each element should, in addition to performing its own function, modify the function performed by one or more of the other elements of the combination. It is sufficient if the combination of the old elements is new and if the combined elements are capable of producing a novel and useful result or an old result in a more facile, economical or efficient way . . . ." (Seikert & Baum Stationery Co. v. Stationers Loose Leaf Co., 51 Fed. (2) 326.

(*To be continued*)

Assuring Greater Prosperity

A feature of the industrial situation which has received scant attention, but which has extraordinary significance, is the fact that while the public was borrowing nearly $150,000,000 a month in 1929, now it is laying aside several hundred millions a month and is building a foundation for national prosperity faster than in many years. As business history bears ample evidence, such huge accumulation cannot long be dammed up. The withdrawal is now as it always was in the past but temporary; the mounting funds must soon seek investment or reemployment. Obviously they will provide a most substantial basis for widespread business improvement, for making another of the prosperous periods that always follow in the wake of dull times.

Meanwhile there is steady advancement toward normal industrial and trade activity. The seeming buyers' strike is noticeably waning, people are realizing more keenly their needs in new goods and replacements; distributers are growing more aggressive as they sense better prospects for sales; and leaders are completing readjustments that are fundamental and which, by placing the entire economic system on a sounder basis than ever before, will surely speed up the restoration of normal conditions.

British Rubber Problems

The Future Giant Pneumatic

THE problem of providing adequate tires for the fast increasing loads of modern automobile transport is one which cannot be considered settled at the present time. The solid tire has been ousted, and the giant pneumatic has come to stay, but in what form or in what numbers per vehicle even the most sanguine of prophets would hesitate to say.

Revolutionary designs have appeared from time to time, such as the Killen tire in which the beads form the widest part of the tire, and the recent Dunlop patent for a tire with a flat tread and a casing molded to a form which would normally be presented in an overloaded tire. Such modifications, if adopted, would require considerable change in other standards, such as rims; and while there is no indication that any departure from standard tire specifications is imminent, such inventions do show a searching after a more suitable form of air container for use as a pneumatic tire. In its present form we may confidently look forward to longer wear, for all is not yet known about the adequate dispersion of carbon black into rubber to secure maximum reenforcing properties; and since a large number of casings after being worn out are suitable for further mileage as remolded tires, this condition will improve the total possible mileage where the service is light. It is doubtful, however, if any tire today which has worn out under the conditions operating in high speed heavy transport work is a problem for remolding, and probably the tread wear is adequate for the casing life in this class of work. Consequently an improvement in the tire tread would necessitate a corresponding improvement in the casing for an overall mileage increase to be generally attained. Whether the all rubber tire, suggested many times, will ever be a practicable proposition, or whether the cushioning effect will eventually be removed from the region of the wheel to that of the spring, are conjectures which time alone can solve.

A problem of more immediate importance, however, lies in the development of large low pressure tires. In England hopes would appear to be largely centered in this type, and tires of 13.50 section are now offered by several manufacturers as alternative equipment to twin 8-inch tires on commercial vehicles. Every tire manufacturer of importance in the country is now marketing this size. Many transport companies, however, regularly exceed the scheduled loads for the tires fitted; consequently casing failures occur from time to time.

It is worth while considering the effect of such a failure in the case of a low pressure giant tire of large section. The bursting of a tire of 13.50 section, or 15.00 section which is now being marketed, is accompanied by a drop in height of the wheel of about 14 or 15 inches. On a front wheel the consequences of such a drop on a vehicle traveling at high speed with a load of 10 to 12 tons may easily be catastrophic; even on the rear axles the bursting of the tire would probably necessitate a wheel change at the actual place of failure. This action is objectionable in many cases, but twin high pressure tires allow the driver to get home with safety without changing if the loads are not severe; and, if a very heavy load is carried, the vehicle can at least be drawn into a suitable place for the change to be effected.

These are some of the objections to the use of very large low pressure tires and certainly lend argument in favor of the use of high pressure tires for heavy commercial work. In some cases chassis makers are anticipating possible trouble with low pressure tires on front wheels by specifying low pressure only on the rear wheels, and high pressure on the front.

Troubles in Producing Mechanical Rubbers

In a factory producing a large number of different kinds of mechanical goods there are often a multitude of different qualities with all the attendant difficulties of high rubber stocks and difficulty of control. The elimination of all qualities which are used only infrequently in preference to others which can be used in their place and are in general demand otherwise, should be attempted at all times so that the total number of different mixings in use may be kept in reasonable proportions.

In most factories each batch of rubber is now made to pass certain tolerances for hardness, modulus, gravity, and in some instances plasticity so that no trouble should arise in the case of a released batch because of poor dispersion of pigment, burning on the mill, etc. Trouble may, however, be met by the use of an unsuitable quality for the purpose intended or by lack of care in the calendering process. The latter may be due to incorrect roll temperature, leading on the one hand to excessive blisters, and on the other hand to roughness through chilling; incorrect gage of rubber may also give trouble either in processing or in the finished article if it is not inspected before use and rejected if outside tolerance. Calender grain can be caused or accentuated if the calender conditions are not suitable for the quality, but it may be impossible to prevent such grain because of the compounds used in the mixing. For example, magnesia crystals aline themselves during the calendering process and give rise to extreme grain. Grain must be removed before open cured goods are made, by a suitable shrinking process, but in molded goods this is generally unnecessary. Since the grain often renders the cured rubber readily tearable in one direction, however, it may be necessary to watch its direction even in a molded article if the latter is liable to split in use.

The majority of factory defects unfortunately are not revealed until after the curing process, but the causes of faulty molding in open cure are many and varied. Many troubles are experienced through bad mold design or incorrect shape of the unvulcanized rubber put into the mold. Trapped air giving rise to surface markings may result from poor design or incorrect venting; it may also be caused by incorrect shape. The first essential, therefore, is to insure that the weight and the shape of the rubber used are correct, and careful attention to this point will insure freedom from excessive scrap and also the possibility of eliminating venting. The latter method for procuring perfectly molded articles can be successfully carried out in most cases, but this work entails capital expenditure and more trim, with consequent extra labor in removing the rubber overflow, and should be avoided as far as possible. Where air marking is not pronounced but arises from time to time, perfection can often be attained by using a suitable mold lubricant. Certainly nothing looks worse than a rubber article the surface of

which is spoiled by surface markings due to improper molding; and although in many cases such articles are in no way affected as regards their usefulness, they command a lower price.

Trouble should not be experienced on account of incorrect gravity provided laboratory controls are functioning adequately and the rubber is correctly cut to gage or weighed out in the shop. Porosity in a cured article may arise from insufficient rubber in the mold, bad mold design, or a poor venting system which allows part of the rubber to flow out of the mold before it is filled. Porosity may also arise in open cure work from air locked in the rubber during forcing or through faulty build up of the unvulcanized article.

A troublesome mixing naturally may itself be responsible for porosity or other troubles such as precuring before molding is complete, but many complaints are made about mixings which are quite satisfactory under suitable conditions. Causes of variation in degree of cure may be found in inadequate ram pressure or presses, reliance on pressure gages instead of thermometers, air pockets in open steam heaters, superheat, and in short cures, variation in the temperature of mold surfaces due to exposure for varying times.

Increasing Tire Sales

Regulations now in force in England provide that a smooth tire is dangerous; so owners of motor vehicles whose tires are in a worn condition are now liable to fines. This action has been directed more particularly to commercial vehicles until recently; but there are indications that the police intend to enforce the rule for private automobiles also, and cases have been reported in the press where motorists have been stopped by the police for tire examination. It is certain that in the case of a car involved in an accident worn tires would be a factor against the owner. Thus, it seems likely that a fillip will be given to the trade because of tires being removed somewhat earlier than was usual before the regulations came into force.

Mail Order Sway Irks Tire Firms

Manufacturers Disposed to Resist Continued Price Control by Big Distributers Which Has Done So Much to Demoralize the Rubber Industry

"PROFITLESS prosperity" among tire manufacturers is said to be doomed, and it is understood that none are really more eager for the change than the so-called "Big Four" that have sustained an immense loss in recent years (estimated at over $20,000,000 for the last year alone) and much of it through insensate competition for the business of mail order houses.[1] Sentiment is developing among rubber leaders for concerted action which would correct at least the more flagrant phases of the rivalry. Encouragement toward establishing a common basis of action is found especially in a pronouncement by United States Attorney General Mitchell that the government is not disposed to interfere with any movement within the industry which would give employes steady work, stockholders fair returns, and consumers unusual value in products.

Thus it is figured that were but $5 added to the tire bill in 1931 of the average motorist, much needed relief, without hardship to car owners, would have been afforded the rubber industry. An average advance of a dollar a tire to the 1931 output would amount to $50,000,000. Were even half as much added on the 1932 production it would be as easily borne, and would not only avert further losses but would assure fair dividends and regular employment needed to benefit all business.

Obstacles to Be Overcome

To the query, if conditions be obviously favorable for a working agreement, why do not the leaders band together for their mutual advantage, it is explained that they are delaying such action until certain difficulties can be ironed out. Chief among the problems is the dictation of prices by the largest buyers, the mail order houses. Since tires constitute 85 per cent of the rubber industry's output, it is not hard to see, therefore, how the mail order concerns can and do influence profits and dividends on securities of rubber companies.

It all started several years ago when a large tire concern, embarrassed with a big inventory of finished goods and crude rubber commitments around 85 cents a pound, sought relief from a big mail order concern. The latter drove a hard bargain; and while the manufacturers got relief, they got it through accepting a mere nominal profit, lowering production costs to automobile makers and dealers, a huge investment in equipment to supply the mail order concern with as many as 22,000 tires a day, and the loss of industrial liberty. With dealer distribution already forced to the limit, rivals pressing for a share of the business, and a covert threat that if the contract were not continued, the mail order concern would set up a factory of its own, there seemed no alternative but to continue. The biggest tire firm could not safely attempt to add such volume to its direct sales; while normal consumption from all sources is 70,000,000 a year, and the potential capacity of the "Big Four" is 125,000,000.

Conditions Ripe for Change

Tire makers are beginning to see a light. Concerns that do not supply tires to mail order concerns or automobile makers are paying good dividends while some others that do have all they can do to make ends meet, where they do not suffer large losses. The menace of manufacturing which the mail order concerns hung over tire makers like a Damocletian sword has lost much of its power to intimidate since it has become better understood that mail order concerns find more profit and less grief in merchandising than in manufacturing, apart from a huge capital tie-up. Henry Ford's unsatisfactory experience with tire making is also recalled.

Conditions, it is claimed, were never so favorable for tire makers renouncing subservience to mail order concerns, and the former are sensing the opportunity the present affords. Rivalries are less keen, petty jealousies less evident, friendships are being promoted, and altogether a more tactful disposition is being shown in the handling of the vexed problem of competition. In short, operation for profit, it is being increasingly realized, is best achieved through rational cooperation.

[1] Abstracted from *Sales Management*, Jan. 2, 1932, p. 16.

National Automobile Show

In Which the Use of Rubber Was an Outstanding Feature

THE Thirty-Second Annual National Automobile Show was held under the auspices of the National Chamber of Commerce in Grand Central Palace, New York, N. Y., January 9 to 16, 1932. The exhibition of cars in every variety of models made by 33 manufacturers was replete with interest due to the many new engineering features introduced to simplify operation to make driving easier and safer and riding more comfortable by the introduction of automatic control.

In modern automobile engineering, skill and craftsmanship have approached the ultimate in the combination of power, speed, automatic control, riding comfort, and beauty of color and finish. In this combination rubber enters as a very important factor particularly in the matter of promoting silence and freedom from vibration so essential to riding comfort and ease. The tentative use of rubber a few years ago, as shock absorbers in spring shackles and engine mounting pads proved so effective in dampening vibrations that its application in car construction is recognized as essential by all car manufacturers.

Many cushioning rubber parts naturally find place in the chassis, where road shocks and engine vibrations first appear. In this part of the car not only is more rubber used each year, but it is applied after exhaustive compounding and physical tests to attain the maximum results in service. An important development in connection with the automotive use of rubber for insulating vibration is the permanent union of soft rubber to metal. The successful solution of this problem greatly promotes the life of the car besides adding to the passengers' comfort. The general acceptance of rubber as an engineering material by the automotive industry virtually amounts to opening a new field of large proportions for its use. Illustrating the possibilities in this direction the manufacturer of a popular car announces that rubber is applied at 240 points in the construction of the car. Each of these applications is made a strategic point to insure dampening of vibration, eliminate noise, or exclude dust or the weather.

The Automobile Industry — 1930

Production (U. S. and Canada)	**3,510,178**
Passenger cars, 2,910,187; Trucks, 599,991	
Registration (U. S.)	**26,523,779**
Cars, 23,042,840; Trucks, 3,480,939	
Motor vehicle manufacturing business in U. S.	
Capital invested (net tangible assets)	$1,880,808,233
Wages and salaries	$647,588,438
Number employed, direct and indirect	5,056,000
Average life of passenger cars—years	**7**
Motor vehicles in the World	**35,603,000**
Proportion of world's motor vehicles in U. S.	**77.4**
American motor output (1930)—% of World's	**87**

Rubber Tire Production

	1929	1930
High pressure casings	18,470,229	8,629,830
Balloon casings	54,837,333	42,348,143
Solids and cushions	545,792	255,350
Inner tubes	73,417,181	52,420,010

The total estimated tire production for 1931 was 48,700,000, and for tubes 48,277,000.

The newest application of rubber to support an automobile engine is that employed in "floating power." Here the weight of the engine is mounted at the ends of its axis at 2 points, one predetermined at the rear of the transmission and the other in front near the water intake exactly in line with the center of gravity and the rear mounting. The engine is thus balanced in rubber on its own axis. Excessive movement of the power plant about its axis is prevented by a stabilizing cantilever spring attached to the low side of the engine. The opposite end of this spring is carried in a rubber mounting attached to the side rail of the chassis. So mounted, the engine cannot transmit vibrations to the chassis, and the result is remarkable for smoothness of power flow.

The accompanying tabulated items relating to the bearing of the automobile industry on that of rubber are quoted from an official publication.[1] These facts show the magnitude of the automobile industry and something of the importance of rubber in relation to it at the present time.

[1] *Facts and Figures of the Automobile Industry.* 1931 Ed. National Automobile Chamber of Commerce.

Tire Firms Stimulate Trade

Before tire stocks go up, evidently stocks of tires must come down. Preliminary to the enhancement of rubber manufacturing share prices, it appears necessary that inventories of casings and tubes particularly must be much reduced. This decrease will undoubtedly be well brought about by the recent sweeping cut in prices ordered by the chief producers. But appreciation in share values is after all but an incident. The primary purpose of the tire firms is to stimulate sales, to maintain volume production, and to provide employment for an army of workers.

Some observers maintain that there can not be an early revival of trade unless prices are cut still further. Demand, or at least willingness to buy, is quite as limitless as ever, but unfortunately it is restricted by lack of purchasing power. Means of production have outrun means of distribution, and only in further lowering cost of production can these economists see a definite, widespread, and well-sustained prosperity.

With their major products cut to almost cost, rubber manufacturers are making more than their share of sacrifice in concession to purchasers. In thus relieving general trade tension they merit much commendation, and it is hoped their action will soon redound to their advantage and the country as a whole.

EDITORIALS

Rubber Industry's Unfulfilled Obligation

IT IS held, and with reason, that an industry of the magnitude and universal importance as that of rubber should regard with greater gravity its responsibility to not only consumers, but to its stockholders, employes, and dealers. Several hundred thousand investors have intrusted to it almost three billion dollars; in normal times over one million Americans alone depend on it directly or indirectly for their livelihood; its products are sold by some seventy-five thousand dealers; and a vast multitude in the Far East depend upon it for their living and purchasing power, in which America is much concerned.

That it has been remiss in sensing properly the obligation that rests upon it, even disregarding its own advantage, is the conviction of at least one trade leader, President William H. Lalley, of the Kelly-Springfield Tire Co. He excepts consumers. The industry's responsibility to the latter, he declares, has been fully discharged, as indicated by the greatest rubber-buying value in history existent today, but says he:

"It has been wilfully lacking in its responsibility to stockholders, dealers, and employes. That some equable basis must be found to correct the situation is an obvious necessity which in 1932 we should solve. An industry rendering such vital service cannot continue to operate to the detriment of stockholders and people who invest their time and labor if it is to maintain the high standard of service to which the public has become accustomed and is entitled to."

Manufacturers More Conservative

THE inclination of most rubber manufacturers to gear more closely than ever production schedules to the legitimate absorptive capacity of the market cannot fail to redound to their credit and advantage, as it must also tend to put the industry as a whole in a much sounder position in what may be called the reconstruction period. Time was in the not-distant past when high pressure annual boosting of output schedules worried economists, who realized only too well that a mad race for production records could not fail to undermine the general credit system and seriously embarrass distributers as well as producers. The forecasts proved only too true, and the too enterprising paid the penalty in slashed prices and reduced, profitless sales.

Many manufacturers had, of course, been misled with the theory that largely increased volume means decreased unit cost. This is often true enough up to a certain point, especially in so far as economies are concerned, but the theory goes awry when sales volume fails to keep pace with production, as many have found to their sorrow. Then is felt increasingly the heavy cost of selling, the carrying of overexpanded plants, the expense of warehousing, and the loss on capital tied up in materials and equipment. Overhead becomes a nightmare.

"Hitch your wagon to a star," may be fine advice for a graduate, but hardly for a business man who must keep his feet on the ground. Hence it is gratifying to note that most rubber manufacturers have learned the wholesome lesson from the recent slump, of trimming their sails closer to the wind, of planning their expansion programs conservatively. Even one of the largest rubber concerns in the country definitely declares that for a long period it will not attempt over 10 per cent annual production increase.

The Old Order Changeth

IF THE last era of prosperity was based on decrease in the cost of production, the next may be grounded on more economical distribution. These two classes of cost, which ordinarily determine whether a business shall be profitable or the reverse, are separated by a gulf which has long been widening. Still we must not despair of narrowing the gap and of preventing benefits accruing from one being greatly offset by the detriment of the other. What we may tolerate in good times becomes in a dull period a millstone about the neck of trade. We can not afford to let it retard recovery, much less hinder future progress.

Many influences are tending to force an early solution of this major problem of distribution cost so that its basis will be at least as rational as that of production. It will take much planning and experimenting, but eventually marked advance will be made through sheer necessity, and not the least gratifying result is likely to be more stabilized trade and employment. Competition in the "reconstruction period" will spur reform in this direction, and forces that can aid enterprises with favorable financing will increasingly insist as a prerequisite that distribution costs be kept within more reasonable bounds than they had been.

In the rubber industry remarkable progress has been made in economical production, but like others it has lagged much under the load of costly distribution. But this handicap can and will be lightened; and when it is, shares of rubber companies may find a place with the choicest industrials in the portfolios of the best investment trusts.

What the Rubber Chemists Are Doing

Aging by the Mercury Vapor Lamp[1]

TWO series of experiments are described in which a Biolux mercury vapor lamp was used. In the first series 4 samples of rubber of different qualities were used, each weighing 3 gr. and rolled out to sheets of 0.4 to 0.5mm. thickness, placed 0.25m. from the lamp, and exposed first for 12 hrs. continuously. The samples were then allowed to rest and subsequently again exposed to the lamp for another 10 hrs. and finally left in the air in diffuse light at ordinary temperature for 16 days. From time to time the samples were weighed. In the first hour after exposure to the lamp, there was a decrease in weight due to loss of moisture. This was followed during the next 10 hrs. by increase in weight as auto-oxidation progressed rapidly. After the second exposure to the lamp of 10 hrs. this auto-oxidation continued of itself without the aid of further action of the lamp. At the end of 16 days most of the samples were dry, had an acrid odor, and their color had undergone considerable change.

In the second series of tests 4 samples of the same quality were radiated at a distance of 0.31m., because 0.25m. was found to be too near. Under varying conditions: (1) direct exposure—the effect here was less than in the first tests chiefly because of the greater distance; (2) placed in a thick cardboard box covered with a plate of ordinary glass thick enough to arrest ultra-violet rays—the action was less than half as effective; (3) placed in a similar box but covered with a plate of Wood glass—no deterioration was noted; and (4) first extracted with acetone and then exposed direct as in No. 1—this sample deteriorated with considerable rapidity.

As shown by the mercury lamp method, deterioration is not only to be noted by the changes of appearance, color and feel, but can easily be ascertained by periodic weighings. The method also offers the advantage of permitting operation on very little material. One or two samples for each type of test suffice to carry out the tests to the end, whereas in methods based on loss of resistance a considerable supply is needed for each series, and it is quite difficult at the start to have identical samples in each category.

[1]L. Graffe, *Caoutchouc & gutta-percha*, Oct. 15, 1931, pp. 15714-18.

Recovery of Rubber and Cotton from Uncured Tire Ply Scrap[1]

Charles S. Powell[2]

THIS new practical method for reclaiming rubber and cotton from uncured tire ply scrap, as developed in practice, is an application of the familiar solvent extraction process. It possesses several advantages over other methods of separating the rubber and the cotton fabric in the scrap particularly from the standpoint of waste materials, for both materials are reclaimed without deterioration. If the process is to have wide application, however, means must be devised for utilizing the dilute rubber cement produced.

As practiced, the salvaging process is conducted with apparatus indicated by the diagram in Figure 1 and described as follows:

The extraction plant consists of an extractor 5 ft. in diameter and 12 ft. long which contains a revolving cage, lined with 30-mesh wire screen (wire diam. 0.013 in.). This cage revolves at about 11 r.p.m. and is provided with doors for charging and discharging.

To operate the extractor it is rotated until the doors are opposite the doors at the top of the outer shell. The cage is then loaded with 1,000 pounds of uncured tire ply scrap and both sets of doors are closed.

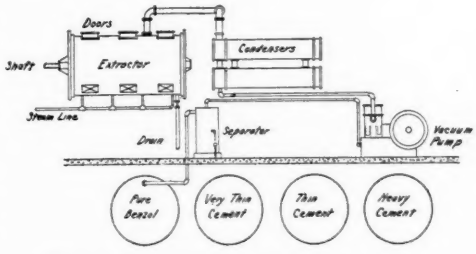


Fig. 1. Uncured Tire Scrap Extraction Apparatus

The extractor is then filled with benzene through the charging line and the cage started rotating. At the end of about 2 hrs. the valve in the drain line is opened, with the cage still revolving, and the heavy cement is drained into the storage tank for heavy cement. The extractor is then filled again and washed for ½ hr. and then drained as before. This second wash also goes to the heavy-cement tank. The next 2 washes are drained into the thin-cement tank, and the last 2 washes go to the tank for very thin cement.

By this time the cotton, which contains less than 1 per cent of rubber, is quite white and clean. However, it contains about 300 gals. of benzene, which do not drain off. For that reason it is necessary to steam the cotton after each run and recover the solvent. To assist in vaporizing the benzene and to keep the temperature as low as possible, the system is provided with a vacuum pump. Steam at 50 lbs. pressure is turned into the extractor through 4 nozzles at the bottom of the outer shell. The benzene is vaporized and passes over with the steam to the condensers, where they are both condensed and drawn to the vacuum pump, which in turn delivers them to the water separator. In the separator the water, being heavier than the benzene, settles to the bottom, where it is drawn off; while the benzene runs off the top into the pure-benzene tank. In filling the extractor, instead of using pure-benzene, thin cement is used for the first 4 washes. For the last 2 washes it has been found necessary to preheat the benzene to 140° F. before washing the scrap. The use of hot washes speeds up the process considerably and helps in obtaining a cotton with a low rubber content.

The cotton is removed through the lower doors of the extractor. It contains about 30% moisture and must be dried before being used. This work is done in large hot-air driers, such as are used for drying reclaimed rubber. The dry cotton is next put through a shredder to remove any small knots and balls of fiber that may have formed.

[1]Presented before a meeting of the Akron Rubber Group, Feb. 9, 1931.

[2]Firestone Tire & Rubber Co., Akron, O.

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Kalite

Kalite is an extremely fine white powder with a somewhat greasy feel. It has a strong clinging nature, adhering more noticeably to paper and other media than do many other mineral powders. It is produced in two grades: No. 1 containing 1 per cent of stearic acid, and No. 3 containing 3 per cent of stearic acid as calcium stearate. The specific gravity is taken at 2.60 for practical purposes; the gravity of No. 3 is actually a little less than this on account of the higher content of calcium stearate.

While Kalite has a fine white color in the powder form, it has practically no coloring effect in rubber and may be used to make products of pure gum color. This lack of tinting power is valuable for colored articles because color effects may be obtained with minimum quantities of coloring material even in the presence of much Kalite.

The changed nature of Kalite as compared with other forms of calcium carbonate is particularly well seen in its behavior on the mixing mill. The amount of heat generated during the mixing, as shown by laboratory tests, is much less than that developed by most other loading materials. This characteristic lessens the tendency to scorching in stocks containing very active accelerators.

In spite of its extremely fine state of division Kalite has no tendency to cake, and its repulsion of moisture removes all tendency toward caking, no matter how long it may be kept in packed condition. *The Vanderbilt News.*

Determining Sulphur in Rubber by the Calorimetric Bomb[1]

The author proposes to apply to the determination of sulphur in crude or vulcanized rubber the method of instantaneous combustion in calorimetric bombs. When the methods of procedure given are carefully followed and expertly carried out, complete combustion is readily secured. Experiments were carried out with various kinds of crude and vulcanized technical rubbers in a Kroecker bomb. With this bomb, which has the advantage of being comparatively inexpensive, it was possible to make rapid successive determinations so that the method can be adopted for the usual laboratory control.

[1] B. Saladini. *Giorn. Chim. Ind. App.*, Sept., 1931, pp. 409-11.

TOXIC SUBSTANCES IN THE RUBBER INDUSTRY. Part XXIV. Methylene Diphenyl Diamine. P. A. Davis, *Rubber Age (N. Y.)*, Jan. 10, 1932, p. 313.

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Rubber Division A. C. S.

Spring Meeting

The Executive Committee of the Rubber Division of the American Chemical Society has decided that it would be unwise to join with the Society in the spring meeting to be held in New Orleans, La., and the fall meeting in Denver, Colo. Therefore it has been decided to hold the spring meeting at Hotel Fort Shelby, Detroit, Mich., February 25 and 26. The banquet will be on the evening of February 25. Sidney M. Cadwell is chairman of the local committee on arrangements for the meeting. The rule with reference to papers has been modified to permit acceptance of papers by the secretary 4 weeks, instead of 6, prior to the meeting.

Chicago Group

The Chicago Group of the Rubber Division, A. C. S., held the first 1932 meeting January 15 at the Auditorium Hotel, Chicago, Ill. E. R. Bridgwater, of E. I. du Pont de Nemours & Co., Inc., gave some new and interesting details concerning the properties of DuPrene, which he explained had properties similar to rubber, except that it was more resistent to water absorption, oil absorption, flame, etc.

Harlan A. Depew, of the New Jersey Zinc Co., read an interesting paper on abrasion. He pointed out the features of the various types of abrasion machines and explained which machine was the best to use.

A new and interesting plan will be tried at the spring meeting to be held in April concerning which notices will be sent out some time in March.

Luminescence of Accelerators and Stabilizers[1]

Rudolf Ditmar

Analysis of accelerators and stabilizers used in the rubber industry by luminescence is only of secondary value as far as identification of these agents is concerned. But the method may be considered to have a certain importance in checking the deliveries of material according to samples supplied, particularly as it appears that the same product prepared by different methods shows a different color. Thus mercaptobenzothiazol is prepared by three firms and while Merkapto, by the I. G. Farbenindustrie, shows orange luminescence, Captax, of the R. T. Vanderbilt Co., shows yellow-red, and Vulcator C. P. X., Silesia, shows clay-colored. Similarly it is found that of the preparations of monosulphide tetramethylthuriam (Monex), of the Naugatuck Chemical Co., shows brown, and Thionex, of the E. I. du Pont de Nemours & Co., very dark brown.

Lists of the most commonly employed accelerators and stabilizers with their luminescence are given.

[1] *Caoutchouc & gutta-percha*, Sept. 15, 1931, pp. 15685-86.

Latex and Dispersions

Liquid Latex

G. D. Kratz

MOST of those who have been engaged in the rubber industry for a period of years have been inclined to think of it as an industry which, from the very nature of its raw material, must be sufficient unto itself. To a certain extent it has always been allied with the fabric or textile industry, but with that exception, its association with other industries has ceased.

In the last 10 years, however, a change has taken place so gradually that even today it is not generally recognized. Thus the increasing use of liquid latex has begun and will continue to change the entire aspect of the rubber industry.

In the past the tire division of the rubber industry has consumed about 85 per cent of the world's production of raw rubber. The failure of that market to absorb crude rubber production has hurt grower, importer, and manufacturer alike, and it will continue to do so until the possibilities in the use of liquid latex in other industries has been recognized.

According to the Rubber Growers' Association during the last 5 years this country has imported an average of about 4,000 tons dry weight of raw rubber annually in the form of liquid latex or latex concentrates. Practically 5,000 tons were imported during 1931. A surprisingly large amount was diverted to other channels not ordinarily associated with rubber in any way. Doubling or trebling the consumption of liquid latex outside the rubber industry would tend materially toward stabilizing the price of crude rubber.

New uses for liquid latex establish new standards and specifications. This statement being true, much of the experimental work that has been done on latex in the past becomes unimportant, and new channels of thought open for investigation.

Almost without exception the many published investigations of rubber latex that have been carried on all over the world have been conducted to the same ends. The thought behind them all is to contribute knowledge which will either assist in increasing the yield of raw rubber on coagulation of the latex or to improve the final quality of the product after vulcanization. Until recently there was little occasion to investigate the different problems arising in the use of liquid latex as such because it has been prepared for consumption by the rubber industry only and has been investigated from that viewpoint alone.

As is well known, in addition to rubber particles liquid latex also contains resinous, protein, and carbohydrate substances and small quantities of organic salts. From the standpoint of the rubber manufacturer these extraneous substances in the latex have been well worthy of close examination and research, particularly with regard to their effect upon the vulcanized product. For example, broadly speaking, a high resin content has been considered undesirable, and a variety of good and bad influences have been attributed to the protein and nitrogenous substances.

When liquid latex is diverted from use in the rubber industry, however, it may frequently function in a capacity where no vulcanization is required. In such a case, the influence of the extraneous substances in the latex is either eliminated or modified. Further, the very substances which may be undesirable in latex used to prepare rubber for vulcanization may be essential for the impregnation of paper stock used in manufacturing artificial leather. This fact is obviously so because the liquid latex used for impregnation work usually must be compounded for the purpose intended.

It is not to be understood that carelessly prepared latices will suffice for use in impregnation work. Quite the contrary is true. But impregnation work does permit the use of latices which might not find favor if vulcanization is required. In the paper trade, for example, latices with 5 to 10 per cent resin content on the rubber are sometimes said to produce better results than if the resin were absent.

In most instances, though, chemists prefer to work with substances or mixtures of definitely known composition. In the compounding of a latex solution one composed of absolutely pure rubber in water would probably be the general preference as the base material. It should not be forgotten that even with highly purified latices entirely different results are obtained with *Hevea Brasiliensis* latex and *Ficus elastica* latex. Results obtained with balata and gutta percha latices are still different from those of the well-known rubbers.

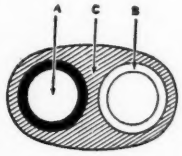
Again, it may be argued that a Hevea latex of essentially pure rubber and water only could be compounded or altered to obtain any desired effect. While this possibility is admitted, it will be accomplished only after much experimentation, and until this is done other latices than Hevea may receive some attention.

In investigating latices and their possibilities for use outside his own industry the rubber chemist must change his entire line of thought. He is required to work with aqueous solutions and often with water soluble substances. Further, the stability of the solution while in process, its viscosity and its power of penetration will deserve his consideration much more than the presence of small amounts of extraneous substances in the latex. Vulcanization, when necessary, may be of secondary rather than primary importance.

Briefly, in the rubber industry the ability of the grower to produce has been pitted against the ability of the manufacturer to consume. There have been no other outlets; thus internally the industry has been continually at odds with itself. The future of the rubber industry, even the trend of tire prices, would appear to rest largely with the chemist and the technologist in discovering new uses for liquid latex in other fields and other products not now generally associated with rubber. These investigations must be conducted from an entirely new standpoint and to other ends than conducted in the past.

Latex Cord

THE intensive study now being devoted to latex is disclosing its many practical applications in rubber and other manufacturing industries. One item that illustrates how it improves the quality, the safety, and the durability of a wire product is the widely used twin lamp cord. This entirely new type of cord embodies unique principles of design never before used in lamp cord construction and results in a safer, longer lived, and more satisfactory article.



A. Stranded, cotton wound conductor; B. 30 per cent Para rubber insulation; C. 60 per cent Latex rubber sheath

The details of its construction are shown in the illustration. Two conductors of regular lamp cord stranding are cotton wound and insulated with a high grade 30 per cent Para rubber compound, black and white for identification. The insulated wires laid parallel are covered with an outer sheath of a new type of rubber composition containing 60 per cent rubber from latex. The sheath completely encircles each conductor and is 1/64-inch thick over and between the conductors.

Its tensile strength is over 2,000 pounds per square inch, and its elongation is 2 inches to 12 inches or 500 per cent without break. Exhaustive tests show this cord to be more than twice as good electrically and more than 3 times as good mechanically as ordinary braid-covered lamp cord.

Review of Recent Patents

SEARCH for practical methods for preparing and compounding latex and dispersions and utilizing them for industrial purposes progresses apace as indicated in patent specifications of current issue. This new technology of rubber is concerned with formulating procedures for wet compounding and manufacturing in contrast with the present system of dry rubber working.

Study of latex and dispersions promises a new era resulting in improvement of quality in many rubber products and marked increased economy by reduction of power required, the elimination of the fire risk of flammable solvents as well as solvent loss by evaporation. The extensive use of latex for new industrial purposes will probably result from research and bring welcome relief to rubber growers in the future.

Latex as derived from nature is a complex dispersion of low stability. It consists of various solids dispersed in an aqueous medium. The usual latex contains about 33 to 37% of solids, of which about 3 to 10% may be non-rubber solids including proteins, resins, sugars, and mineral salts. It is the practice, when shipping or storing latex, to add ammonia as a preservative. The ammonia evidently combines with the protein and resin content of the latex to form more stable proteinates and resinates as the protective colloids.

In a number of recent patents chemical treatment is used to attain special results. By one invention the rubber yield of latex is increased by mixing with it substances that will react to form a suitable diluent or filler for the rubber. Vegetable and mineral oils, resins, and colloids such as glue or a gum are named. These are selected according to the results desired and the latex coagulated by an aldehyde.

There is a purely chemical method of treating latex to produce a rubber having the milling characteristics of coagulated rubbers but maintaining the strength, etc., found in evaporated rubbers. In this case a solution of commercial ammonium phosphate is the reagent that is added to the latex.

Latex used for impregnation of a porous web of felted cellulose fiber, where capillary action is high, is advantageously treated for such work to insure uniform distribution of the rubber particles when evaporation of the water takes place, also to impart water resistance and other characteristics to the rubber in the same class of work.

The pioneer discoverer in the field of rubber dispersions states in a recent patent that he has found that it is possible to produce aqueous dispersions of many substances which hitherto have been regarded as impossible of aqueous dispersion. Among such substances are crude rubber, balata, gutta percha, non-colloidal sulphur-terpenes, natural and synthetic resins, vegetable and mineral waxes, gums, tars, pitches, bitumens, animal and vegetable oils, etc., which are soluble in non-aqueous solvents.

Briefly the substance to be dispersed is dissolved in a suitable solvent and the solvent replaced in whole or in part with water without precipitating or coagulating the dissolved substance but leaving it as the disperse phase in the continuous aqueous phase. The character of the soap utilized as the dispersing agent for stabilizing the dispersion depends to some extent upon the character of the body to be dispersed, but in most cases ammonium oleate is the most satisfactory.

Latex and Vulcanized Scrap

Vulcanized scrap, plasticized and emulsified in aqueous dispersion, is in a condition to be made into useful products by electrodeposition of the rubber from the liquid dispersion upon anodic molds, plates, or screens, or the dispersed rubber particles may be deposited by other suitable means such as dipping, spreading, spraying, extruding, molding, etc. This process evidently expands advantageously the use of reclaimed rubber for quality products.

Rubber electrodeposited from a mixture of equal parts of latex and an aqueous dispersion of a plasticized vulcanized rubber has shown higher modulus and greater tensile than rubber from pure latex.

Round Rubber Knitting Yarns

ORDINARY rubber thread cut from vulcanized calendered sheet is not well adapted for knitting elastic fabrics because it hits the needles on a corner of its square form causing a peculiarity in the knitted effect, which is eliminated by the use of round rubber threads produced from latex. The method of manufacture comprises forcing continuously by air pressure concentrated latex from a supply tank through circular orifices in nozzles. The streams of latex exude into a tank containing a coagulant which promptly sets the rubber into fine round thread form. At this stage the thread is uncured and passes next through water to remove adhering coagulant. The washed thread is next conveyed through a drying chamber from which it passes successively through vulcanizing and hardening solutions after which operation it is washed, dried, wound up without change of form, and stored to complete vulcanization.

The limit of fineness of cut thread is 50 per inch. Its normal length is 70 yards, or 210 feet. Latex thread can be produced as fine as 100 per inch and in continuous lengths to suit knitting or weaving requirements. Commonly latex thread is made in 500 feet lengths.

Rubber yarn is prepared from latex thread by winding the stretched rubber with cotton which regulates the amount of stretch of the thread in the finished elastic fabric. The sizes of round rubber yarn are designated by a system indicating its diameter and also the size of a cut thread containing the same volume of rubber. For example a 20/24 round rubber yarn is 1/20-inch in diameter and contains an amount of rubber equivalent to a cut thread 1/24-inch square.

Latex and Dispersion Patents

United States

1,832,929. **Mineral Oil Composition.** W. W. Evans, New Rochelle, assignor to R. T. Vanderbilt Co., Inc., New York, both in N. Y.

1,833,038. **Aqueous Dispersions.** W. B. Pratt, Wellesley, Mass., assignor by mesne assignments, to Dispersions Process, Inc., Dover, Del.

1,834,148. **Treating Rubber Latex.** W. A. Gibbons, Great Neck, N. Y., assignor to Naugatuck Chemical Co., Naugatuck, Conn.

1,834,481. **Conditioning Latex.** F. W. Vogel, P. Brown, and R. B. Hill, assignors to Brown Co., all of Berlin, N. H.

1,834,490. **Conditioning Alkali-Preserved Latex.** R. B. Hill, assignor to Brown Co., both of Berlin, N. H.

1,834,973. **Scrap Rubber Product.** J. W. Schade, Akron, and H. L. Trumbull, Hudson, assignors, by mesne assignments, to American Anode, Inc., Akron, all in O.

1,834,974. **Latex Rubber Article.** J. W. Schade, Akron, and H. L. Trumbull, Hudson, both in O., assignors to B. F. Goodrich Co., New York, N. Y.

1,835,365. **Treatment of Latex.** F. O. Woodruff, Quincy, assignor to H. H. Beckwith, Brookline, both in Mass.

1,836,021. **Dispersion of Polymerized Styrol.** W. A. Gibbons, Montclair, N. J., assignor to Naugatuck Chemical Co., Naugatuck, Conn.

1,836,595. **Aqueous Rubber Dispersions.** R. B. Hill, assignor to Brown Co., both of Berlin, N. H.

1,837,162. **Latex Treatment.** R. B. Hill, assignor to Brown Co., both of Berlin, N. H.

1,838,826. **Treating Latex.** F. Gunther, H. Hopff, and C. Schuster, all of Ludwigshafen, assignors to I. G. Farbenindustrie, Frankfort a. M., both in Germany.

Dominion of Canada

317,631. **Sheet Rubber from Latex.** Canadian Industries, Ltd., Montreal, P. Q., assignee of R. B. F. F. Clarke, Bramhall, England.

318,068. **Gas Cell Fabric.** Goodyear Tire & Rubber Co., assignee of W. C. Calvert, both of Akron, O., U. S. A.

United Kingdom

356,125. **Latex.** Naugatuck Chemical Co., Naugatuck, Conn., assignee of A. A. Nikitin, of U. S. Rubber Co., Passaic, N. J., both in the U. S. A.

356,310. **Latex in Paper.** L. Mellersh-Jackson, London. (General Rubber Co., New York, N. Y., U. S. A.)

357,238. **Adhesive Rubber Product.** Imperial Chemical Industries, Ltd., London, R. B. Fisher, F. Clarke, E. B. Robinson, and A. Shepherdson, all of Manchester.

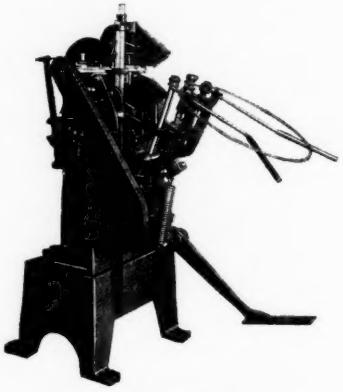
357,350. **Chewing Gum.** W. W. Triggs, London. (Sweets Laboratories, Inc., New York, N. Y., U. S. A.)

357,603. **Bituminous Rubber Composition.** S. S. Sadtler, Springfield Township, Pa., U. S. A.

Germany

539,739. **Reversible Latex Concentrates.** Metallgesellschaft A. G., Frankfurt a. M.

New Machines and Appliances



Terkelsen Bead Wrapper

Tire Bead Wrapping Machine

A HIGH speed tire bead wrapping machine is an indispensable part of the equipment of the modern pneumatic tire factory. The machine pictured is designed to construct a bead superior to any hitherto made. Its action is semi-automatic and permits the operator sufficient time to handle the work; also it eliminates labor in handling finished beads. The method of handling allows 3 to 4 beads to be wrapped their entire circumference in one minute. The floor area required is 2 by 3 feet. The machine is operated by a ½ h.p. motor automatically controlled for starting and stopping. The wrapping material is rubberized fabric 5/8-inch wide and sufficiently tacky to adhere easily.

The action of the machine is very rapid and takes place as follows: In the starting position the feed gears are open, and the end of the wrapping material lies in front of the grip finger. The operator lays a bead between the feed gears on the bead support rods. The foot treadle is depressed: this position closes the feed gears onto the bead and carries it into the shuttle area. When correctly positioned, the tape is held securely against the bead, the feed gear brackets are locked in place, the motor starts, and the wrapping begins. All of these actions take place in a fraction of a second.

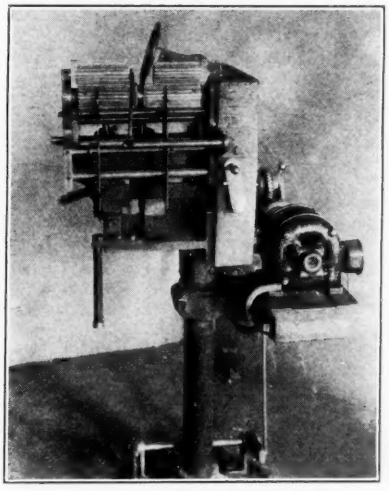
When the wrapping is completed, the machine automatically stops with the shuttle opening in the correct location; the feed gear brackets are released; the knife is released and comes forward, severing the tape and laying the end of the tape down neatly because of the tackiness of the tape. Further motion of the feed gear brackets draws the knife to its original position, leaving the end of the tape directly in front of the grip finger ready for the next operation.

Adjustment for different size beads is made by positioning the square collar on the upper end of the measuring rack. The actual wrapping time for different size beads ranges from 10 to 14 seconds, permitting a production of 3 to 4 beads per minute. As high as 10 beads per minute may be wrapped by mounting 3 units on a rotating turret.

Depressing the foot treadle not only puts into effect the functions described above but simultaneously starts the turret in operation. The turret stops automatically when the next unit is in loading position; yet the unit that was started to wrap continues to wrap until its completion. Terkelsen Machine Co., 326 A St., Boston, Mass.

Bus and Truck Tire Bead Flipper

THE rapidly increasing numbers of truck and bus tires for heavy and exacting service have stimulated the study of suitable bead construction and means for its accomplishment.



Utility Bus Tire Flipper

The machine shown in the accompanying illustration was specially designed for applying the wide heavy flipper strips around bus and truck tire bead cores. The machine is motor driven and of simple compact construction, being mounted on a pedestal. The flipper strip is applied around the bead by the inclined wheel as the bead revolves in the groove provided for it. All strain is relieved by shortening the center of the cover strip by a special process which permits the bead to be built between the tire plies without the possibility of stretching or straining the edges.

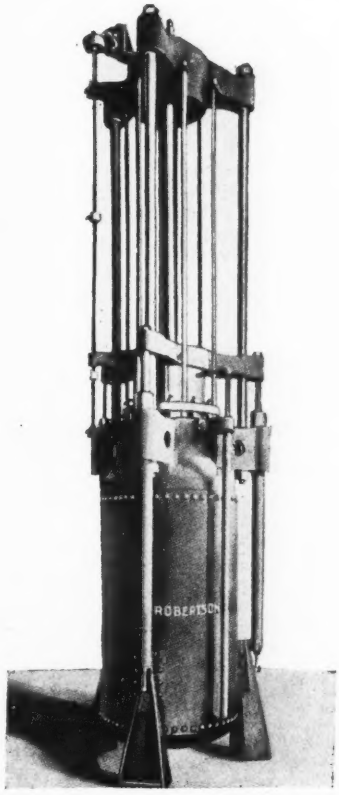
The machine here pictured is capable of handling flipper stock of 1, 2, or 3 plies and does the work speedily and economically. Utility Mfg. Co., Cudahy, Wis.

Hydro-Pneumatic Accumulator

THE hydraulic accumulator here illustrated presents several interesting features among which is the low air pressure required for its operation. The air tank which supplies air at 175 pounds maximum pressure, forms the base of the accumulator. The hydraulic ram is supported by the cross-head above, and the hydraulic cylinder and the air ram are floating on the air pressure, being guided at the bottom by their respective glands and at the top by the intermediate platen. The latter, in turn is thoroughly guided on rods for the vertical movement. The hydraulic cylinder is bronze bushed and fitted with a bronze packing gland. Both rams are outside packed with square flax packing. The limit switch and tell-tale rod automatically control the supply pump.

The accumulator is protected from possible failure of the limit switch by a by-pass vent in the hydraulic ram. Cushion springs prevent the operation of this by-pass except when it is required. An auxiliary air compressor with automatic control maintains air pressure in the air cylinder and storage tanks.

This accumulator may be placed on an



Robertson Accumulator

ordinary factory floor, does not require a heavy foundation, and occupies a minimum of floor space. It is built in sizes from 96 gallons at 1,500 pounds pressure to 2½ gallons at 6,000 pounds per square inch hydraulic pressure. John Robertson Co., Inc., 123-137 Water St., Brooklyn, N. Y.

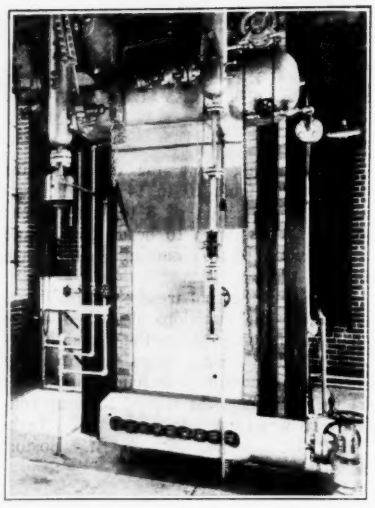
Eye-Level Gage

THE eye-line gage for indicating water level at a distance from and below the water level of the boiler is here pictured as applied in service. This device is the result of investigations made possible by the new high pressure steam laboratory of the makers. By means of this eye-line gage boiler water level readings are brought down to the boiler room floor for constant convenient checking by furnace operator or water tender.

A stainless steel tube extends down from the water column to the boiler room level. Here a standard flat glass gage displays a movable plunger or target which indicates to the furnace attendant the water level in the boiler above. This plunger is connected by a stainless steel or monel chain with the actuating balanced weights in the auxiliary column. The position of the target clearly duplicates the exact position of the water level above. At this distance below the water column, water in the connecting tube and gage is relatively cool, hence no erosion of gage glass and no need of mica protection, resulting in much clearer vision.

Since the water level indicator is practically at room temperature, the difficulty with flat glasses at high temperatures is eliminated. Sediment is negligible, as the sediment chamber in the auxiliary column prevents its entrance into the tube. Even if the water in the gage should become cloudy, a slight opening of the drain at bottom of gage will immediately clear the water.

Thus the boiler water level's rise or fall can be anticipated before the safety alarm is actuated; making for greater boiler safety and efficiency. There is no chance for incorrect reading of the boiler water level because of the remoteness of its position or faulty lighting of water gages high up on the boiler.



The Caldwell Studio

Yarway Eye-Line Water Level Indicator

In order that the operator, when he comes on his shift, may be quite sure that his water level gages are accurately responding to the boiler water level, he can operate the drain valve, which will immediately reduce the water level in the column, thus allowing the upper as well as the lower eye-line indicator to respond to the artificially changed water level. Yarnall-Waring Co., Chestnut Hill, Philadelphia, Pa.

Gas Steam Boiler

THE gas-fired boiler, shown in the accompanying illustration, is a most convenient means for supplying process steam in many manufacturing industries. In rubber working it is available for operating individual tire vulcanizers, steam platen presses for rubber testing laboratory purposes, and all steam treatment of rubber. It provides steam in 4 minutes at fixed pressures and unvarying steam volume.

This tubular boiler is both automatic and gas fired, built in a range of capacities to match special requirements. Some of the special structural features are as follows: The internal or boiler proper is jacketed by sheet steel and asbestos spaced far enough from the shell to permit the hot gases to pass around the shell as well as through the tubes. This feature increases the steaming efficiency, effects economy, and decreases the per h.p. floor space.

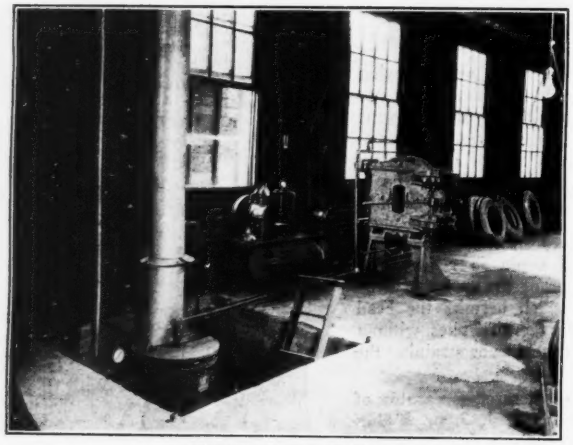
The boiler is equipped with automatic gas control, which can be set to maintain any desired steam pressure. All boilers of 7 h.p. and larger are provided with a low water gas "cut off." This device reduces to a minimum the possibility of burning out the boiler because of low water. The boiler is regularly built and approved for 100 pounds' per square inch working pressure, and for working pressures in excess of that pressure it is specially built. Mears-Kane-Ofeldt, 1903-1915 E. Hagert St., Philadelphia, Pa.

English Tubing Machine

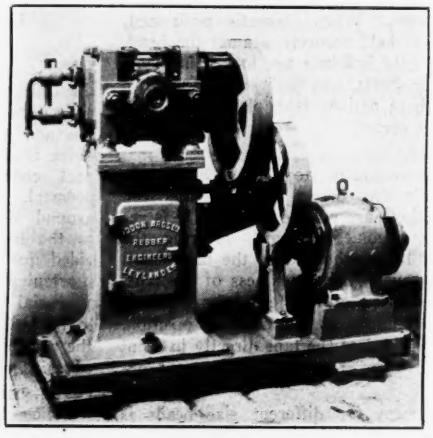
THE familiar two-roller machine pictured in the illustration has many strong adherents who recognize its merits on specialized work and for its reliability and accuracy in the production of stock demanding extremely fine dimension limits difficult to attain and maintain in the execution of large orders. Small tubes and solid cord stock, beading, fillers, auto door and window jointing stock, fountain pen stock, and other fine limit goods are among the many and varied articles that come within the capacity of these machines.

The illustration shows one of these machines with die box in position and arranged for driving by constant speed motor. The rollers are forged steel, case hardened and ground, and are contained within heavy housings fitted with phosphor bronze bush bearings. Heating and cooling glands are provided for each roller, and offer ready means for controlling the working temperature.

The die box is of special design, having an improved type of scraper which collects the rubber from the face of the rolls and directs it into the box where it is highly compressed and extruded through dies of standard design. Iddon Brothers, Ltd., Leyland, Lancashire, England.



Ofeldt Steam Boiler



Iddon Two-Roll Forcing Machine

New Goods and Specialties

Gaytee Silhouette

Neat Overshoe for Rain or Snow

MORE than ever do the longer clinging gowns of the latest dictates of fashion center attention on the feet. If those feet are shod in clumsy galoshes, the effect of the entire costume, no matter how stunning, is completely ruined.

Cognizant of the demands of the ultra-smart, then, the United States Rubber Co., 1790 Broadway, New York, N. Y., has designed another Gaytee overshoe, the Silhouette, which has no snaps or fasteners. Just one quick pull and the overshoe is on, for it is made of extremely lightweight rubber that stretches easily to slide over the leather shoe. The lines of the Gaytee Silhouette lend to the ankle a decidedly graceful effect. This smart footwear is made in black, brown, russet, and smoke.

Carpet Vulcanized on Rubber

OF INTEREST to the trade is an idea that recently has been patented by Benno A. Zedler, 2000 N. Farwell Ave., Milwaukee, Wis.

It consists briefly of carpet vulcanized on rubber and the method of producing it. The advantage of this style of carpeting is its economy and appearance; it is resilient and durable as well.

Stair treads made of carpet with rubber fiber vulcanized to the back are shaped permanently to fit the nosing on a step. The treads are fastened down with linoleum paste or are left loose. They do not mar the woodwork or terrazzo of a step in any way.

Carpets vulcanized on rubber can be used as runners for corridors and aisles, as automobile mats requiring no edge binding or snap fasteners, or for room sized rugs. In each case the carpet will lie flat and can be secured down with linoleum paste if desired. The carpet will not slip or scuff up, is waterproof, and can be easily cleaned. It is economical, durable, and silent. The edges will not ravel out, for they are set in rubber.

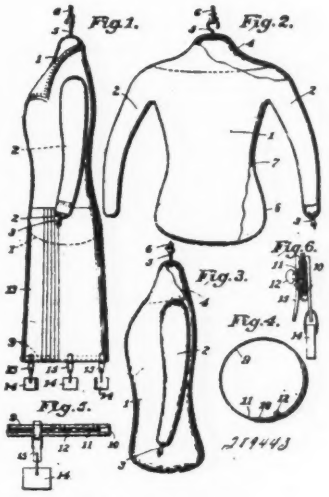
The advantage of economy is always present, whether the material is made up as stair treads, runners, automobile mats, or rugs. An inexpensive carpet may be used, which, when vulcanized on rubber, will outwear a higher priced carpet not so strengthened. Stair treads are interchangeable and renewable so that when wear occurs on any step of the stairway, the treads can be changed about or any unit replaced. The style of stair carpeting now in use has not this economic advantage. Experienced labor to lay stair carpet, corridors, aisles, or rugs is not necessary, and the customary drilling of holes for fastening purposes in terrazzo, tile, or composition floors is entirely done away with.

Latex Stocking Protector

KING WINTER now is here with cold, rain, mud, and snow, and the consequent splashing on Milady's silken hose. She is, therefore, ever on the alert for adequate protection for her stockings.

A new product to meet this demand comes from Latex Rubber Products, Inc., Akron, O. Hosegards, as they are known, are of chiffon weight pure latex; so thin, they are transparent; so strong, the manufacturer guarantees them against deterioration for 2 years. These protectors are knee length, as shown in the illustration, and boast a patented heel designed for long wear. They come in 2 colors, beige and gun metal, and 2 sizes: No. 1, small, for 8, 8½, and 9 standard stocking sizes; and No. 2, full, for 9½, 10, and 10½. Each pair of Hosegards is packed in a carrying pouch and cellophane wrapped.

Putting on Hosegards



Inflatable Figure

Device to Prevent Shrinkage of Dresses

HOW often, after a dress has been cleaned, the owner has been annoyed to find that it has shrunk. With that thought in mind Sahag G. Sahagian, Pocahontas, Va., has invented an inflatable bag, which he claims will prevent shrinkage of garments being cleaned.

The invention consists of a collapsible bag of thin rubber, which can be inflated to the exact size of the garments measured before cleaning. The bag conforms in shape to the upper part of the human body, and a relatively stiff material is within the upper edge, extending from shoulder to shoulder. The neck portion has means for suspending the bag. An expansible ring is adapted to be placed in the lower part of the dress whereby the latter will be prevented from shrinking in length and in width. Weights are supported around the ring. The bag is inflated with compressed air. When not in use, it is deflated and requires very little storing space.

Rubber-Supported Foot-Glove

THE fad among women of wearing legless stockings in mild weather is likely to receive a new impetus through the recent invention of a rubber-supported foot-glove. The rubber feature is an insert of proofed corset cloth shaped like a shoe-counter and sewed within the shortened stocking just below the level of shoe-top. The device is aimed not only to hold up the stocking snugly but also to protect the back of the heel from being calloused by the stocking through lack of garter or other support. A patent has been allowed the inventor, Mrs. Lorene S. McClelland, and manufacture begun. M & M Foot-Glove Co., 1057 N. La Brea Ave., Los Angeles, Calif.

American Rubber Executives

The brief personal sketches to be published on this page will eventually form a valuable record of the part played by American rubber executives in the progress of the industry. Presidents, vice presidents, secretaries, treasurers, sales and advertising managers, and other "key-men" are invited to send us their biographical data.

Karl Arnstein, v. pres., engr. *b.* Mar. 24, 1887, Prague, Czechoslovakia; grad. U. of Prague, asst. professor, degree of doctor of technical sciences; specialized in airship engineering with European Zeppelin organization at Friedrichshafen, Germany, becoming chief engr. of the company, 1914; joined Goodyear Zeppelin Corp., Akron, O., a subsidiary of Goodyear T. & R. Co., 1924; won competition for designs for military rigid airships of 6,500,000 cu. ft. capacity started by the U. S. Bureau of Aeronautics, and for which his company was awarded contracts for 2 ships of this type, 1928; has been chief designer of about 90 military and commercial airships; has submitted many papers on aeronautics before American and foreign engineering societies, and published many articles on subject in United States and Europe; given degree of Doctor of Engineering by U. of Aix-La-Chapelle, Aachen, Germany. *Address:* Akron, O.

Nelt Barr, pres. *b.* Apr. 24, 1882, Windsor, O.; gram. sch., Ashland, O.; honored by Ohio State Board of Optometry for work in practical and theoretical physiological optics, 1920; traveling salesman for New York jewelry firm. 1902-7; engaged in retail business; took up with rubber goods mfg., 1916; org. and became pres. of Barr Rubber Products Co., Lorain, O., 1919; moved company and plant to Sandusky, O., 1924; obtained many patents for dipped goods equipment. *Member:* Masonic Order, Knights Templar, and B. P. O. E. *Address:* 403 Fulton St., Sandusky.

Thomas C. Davis, mgr. industrial sales *b.* 1899, Virginia; Randolph-Macon Coll.; B.S., E.E., Virginia Mil. Inst., 1920; grad. student course, Westinghouse Elec. & Mfg. Co., E. Pittsburgh, Pa. serving in all depts. in connection with sales school; same company, 4 yrs. in headqtrs. sales dept. in connection with major industry sales, and 4 yrs. in charge of headqtrs. sales div. for certain electrical equipment; mgr. ind. div., mech. sales dept., Dayton Rubber Mfg. Co., Dayton, O. *Address:* business, Dayton Rubber Mfg. Co., Dayton.

Ernest R. Kenner, mgr. sales promotion *b.* Atlanta, Ga., Sept. 8, 1885; gram. sch., Georgia Inst. Tech., 1907, deg. mech. engr.; engrg., sales, estimating, Allis-Chalmers Mfg. Co., Milwaukee, Wis., Atlanta, Ga., and Cleveland, O., 1907-16; apptd. chief engr., Plant 2, Firestone T. & R. Co., Akron, O.; entered U. S. Army service as mech. supt., Muscle Shoals, 1917; joined Wellman, Seaver, Morgan Co., as asst. gen. mgr. sales, 1919; engaged by B. F. Goodrich Co., for sales promotion of rubber goods in South, 1914; apptd. mgr. sales promotion in New York dist. Jan. 1, 1928. *Member:* Amer. Soc. Mech. Engrs. and Masonic Order. *Address:* business, B. F. Goodrich Co., 33 W. 60th St., New York, N. Y.; residence, 5 Savoy Park, Woodcrest Ave., White Plains, N. Y.

Arthur Randall, gen. mgr., v. pres. *b.* Dec. 27, 1890, Minneapolis, Minn.; high sch., Univ. of Minnesota, 1913; salesman Northwestern Tire Co., Minneapolis, 1913; mgr. St. Paul, Minn., br., 1914; gen. mgr., 1919; again St. Paul mgr., 1929; again gen. mgr. and v. pres. Northwestern Tire Co. and br. mgr. Lee of Conshohocken, Pa., 1930. *Member:* B. P. O. E. 59, F. and A. M. St. Paul 3, Phi Gamma Delta, and local trade associations. *Address:* business, 1011 Harmon Pl., Minneapolis, Minn.; residence, 2163 Iglehart St., St. Paul, Minn.

Samuel B. Robertson, engr., v. pres., gen. mgr. *b.* Milton, Mass.; Milton gram. schs., engrg., M. I. T.; div. engr., supt., gen. supt., Penn R.R.; apptd. rubber engr. and factory planner by B. F. Goodrich Co., Akron, O.; overhauled and constructed Goodrich foreign plants as director of engrg. with headquarters in Akron; elected v. pres. and apptd. gen. mgr., Pacific Goodrich Rubber Co., Los Angeles, Calif., 1928; chosen v. pres. and gen. mgr. tire division, B. F. Goodrich Co., Akron, Sept. 8, 1931. *Address:* B. F. Goodrich Co., Akron.

Ed. J. Rogers, engr., br. mgr. *b.* June 5, 1891, Lyons, Kan.; gram. sch., Muskogee, Okla., high sch., mech. engrg., Oklahoma U.; salesman mining equip., Swan Machinery Co., Joplin, Mo., 1913; joined Goodyear T. & R. Co., 1915; general line salesman, mech. goods salesman, Dallas, Tex., dist. mgr. mechanical good sales; joined Seiberling Rubber Co., 1922, as salesman; apptd. Kansas City, Mo., br. mgr., 1925. *Member:* Masonic Order, 32nd degree Scottish Rite, and Shriner. *Address:* Seiberling Rubber Co. br., 2004 Baltimore Ave., Kansas City.

Charles Edward Speaks, dir., v. pres., gen. mgr. *b.* May 21, 1887, Washington, D. C.; gram., high schs., grad. in 1906; joined factory sch., Firestone T. & R. Co., Akron, O., 1912; mgr. cycle tire dept., 1913; mgr. truck tire dept., 1916; org. dept.; joined U. S. Army 1917, serving in France till March, 1919; retired June, 1919, as Lt. Col.; decorated with U. S. Distinguished Service Medal and French Officer Academy Beaux Arts with Palms; apptd. mgr. gov't. dept., Firestone, June, 1919; European Firestone mgr., London, Eng., 1920-26; mgr. truck and bus tire dept., Firestone, Akron, 1926-27; dir., v. pres., and gen. mgr., Firestone Footwear Co., Boston, Mass., 1927. *Member:* Masonic Order, Tadmor Temple Shriners, Army and Navy Clubs, New York, N. Y., and Washington, D. C. *Address:* business, 141 Brookline Ave., Boston, Mass.; residence, 221 Valentine St., W. Newton, Mass.

Frank A. Steele, supt. *b.* May 10, 1884, Marshallville, O.; B. S., Wooster U., 1908; B. S., Case School of Applied Sc., 1910; chem., Goodyear Tire & Rubber Co., Akron, O., 1910; Goodyear prod. dept., 1911; successively dept. foreman, gen. foreman, and div. supt.; transferred to prod. dept., new Goodyear plant, Los Angeles, Calif., 1919; asst. gen. supt. Los Angeles Goodyear plant, May, 1928; supt. new Goodyear plant, Gadsden, Ala., Dec., 1929. *Member:* Masonic Order, Alpha Tau Omega, Sigma Xi, and Tau Beta Pi fraternities. *Address:* Goodyear Tire & Rubber Co., Gadsden, Ala.

John Jay Watson, pres. *b.* Nov. 12, 1874, Jamestown, R. I.; grammar sch., Rogers High sch., Newport, R. I., Bryant & Stratton bus. coll., Providence, R. I.; Industrial Trust Co., Providence, R. I.; dir. and treas., Joseph Banigan Rubber Co., 1899; treas., U. S. Rubber Co. and member exec. com.; pres., Rubber Goods Mfg. Co.; pres., General Rubber Co., investigated rubber planting possibilities overseas and started U. S. Rubber Co. plantations in Sumatra; senior member Watson & Pressprich, private bankers, New York, N. Y., 1910; v. pres. and treas., International Agricultural Corp., becoming pres. and chrmn. of board, 1923; pres. and chrmn. of board, Lee Rubber & Tire Corp.; chrmn. of board, Republic Rubber Co.; pres., Prairie Pebble Phosphate Co.; pres., Florida Mining Co.; dir., Lawyers' Trust Co., Lawyers' Title & Guaranty Co., Fidelity-Phenix Ins. Co., Overseas Railways, Inc., Seatrain Lines, Inc. *Member:* Sons of Revolution, New England Society, Society Colonial Wars, Society American Wars, Union League, Riding, Metropolitan, Church, Sleepy Hollow, Nassau Country, Squadron A., New York Yacht, Blind Brook, Seawanhaka Corinthian Yacht, Congressional (Washington, D. C.), Everglades (Palm Beach, Fla.), Union Interalliee (Paris, France), Republican, Porcupine (Nassau B. I.) clubs. *Address:* business, Room 2324, 61 Broadway, New York.

Rubber Industry in America

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The General Tire & Rubber Co., Akron, has announced a new merchandising subsidiary known as the J & G Merchandising Corp. recently incorporated with a capitalization of $50,000.

The Firestone Tire & Rubber Co., Akron, at a recent meeting of the board of directors appointed Harvey S. Firestone, retiring president, to the newly created post of chairman of the board to enable him to give more effective direction to the administration of all phases of the company's affairs, including its subsidiaries all over the world. John W. Thomas, vice president and general manager, was made president. To the board was elected Russell A. Firestone, vice president of The Firestone Tire & Rubber Co. of California and manager of the Akron sales district. Ross J. Cope, formerly vice president and general manager of the California Firestone Company, has been made its president. The following were reelected to the directorate: Mr. Firestone, Mr. Thomas, Harvey S. Firestone, Jr., Stacy G. Carhuff, B. M. Robinson, John J. Shea, Harris Creech, H. H. Hollinger, and Edson A. Oberlin.

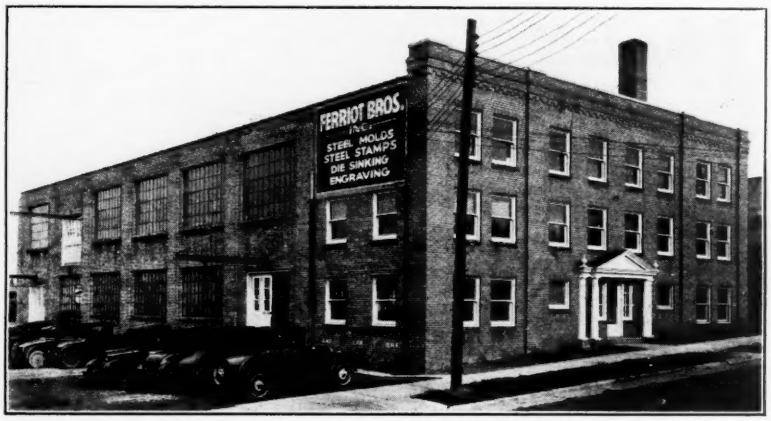
The B. F. Goodrich Co., Akron, according to an announcement by President J. D. Tew, recently appointed Philip J. Kelly, for the past 3 years advertising manager, assistant to C. B. O'Connor, general sales manager. Mr. Kelly is succeeded by P. C. Handerson, formerly of Griswold & Eshleman, Inc., Cleveland advertising agency. Robert J. Geis, sales promotion manager of the New York, N. Y., Goodrich branch, has been made district advertising manager for New York, succeeding J. D. Kattenhorn, resigned. At a meeting of the directorate in New York on January 13 to fill vacancies in the board, Corliss Sullivan and R. S. Rausch were elected to it. Attending the meeting were President Tew, Treasurer V. I. Montenyohl, and Secretary S. M. Jett, all of whom immediately returned to Akron.

Major Doolittle Inspecting Rubber Covering on Airplane Wings

Rubber covering for airplane wings, designed to prevent abrasion of leading edges during fast flight in rain and sleet, has been tested successfully by Major James H. Doolittle, aviation director for the Shell Petroleum Corp. The rubber was manufactured and applied by Goodrich to the Shell Lockheed. The tailored strips are similar in texture to that of the Goodrich de-icers, but have no ice-removing expansion tubes.

Seiberling Rubber Co., Akron, through President F. A. Seiberling has announced the appointment of his son, James Penfield Seiberling, who formerly assisted his father in the management of the company, as sales manager to succeed H. L. Post, who becomes assistant to the president. Prior to 1931 J. P. Seiberling, who began his rubber career when 12 years old as an office boy at The Goodyear Tire & Rubber Co., was vice president in charge of sales at the Lambert Tire & Rubber Co., Barberton.

The Patterson Engineering Corp., designer and manufacturer of machinery for rubber, plastics, fuel, and other industries, with offices in the Federal Bldg., Akron, and factory, The Patterson Foundry & Machine Co., E. Liverpool, is controlled by President Richard L. Cawood, president of The Patterson Foundry & Machine Co., with which the engineering corporation is closely affiliated; Vice President P. E. Welton, well known as a consulting engineer for the rubber industry; and Secretary-Treasurer Russell B. Koontz, formerly president and general manager, The Adamson Machine Co., Akron.



Eastman Photo Studio

New Plant of Ferriot Bros., Inc.

Ferriot Expands

Ferriot Bros., Inc., recently moved into a larger building at 219 E. Miller Ave., Akron, O., and purchased all the equipment of its former occupant, The Wadsworth Core & Machine Co. Ferriot also bought several large machines so that, with its 20,000 square feet of floor space, it is now in a position to build any type of mechanical mold used by the rubber trade, including all necessary die sinking and engraving. The company maintains also an engineering and drafting department which will be pleased to design and make prints on molds for firms desiring this service.

Within the last 3 months Ferriot has nearly doubled its working force as well as its sales and considers the future outlook very bright. Officers include E. F. Ferriot, president; A. A. Ferriot, secretary-treasurer; and G. H. Ferriot, general manager.

Arnold H. Smith, of the Graesser-Monsanto Chemical Works, London, England, a subsidiary of the Monsanto Chemical Works, St. Louis, Mo., is in the United States visiting Akron, St. Louis, Nitro, and other places to correlate the development work of the different divisions of the parent organization. Mr. Smith states that the British concern, effective January 1, changed its corporate name to the Monsanto Chemical Works, Ltd. It manufactures in England and distributes there, as well as on the Continent, accelerators, antioxidants, and other well-known products of the Rubber Service Laboratories Co., Akron.

T. F. Walsh, former president of The Swinehart Tire & Rubber Co., Akron, while motoring to New York, N. Y., on January 8 met with an automobile accident near Huntington, Pa. He was taken to the hospital, where he was treated for body bruises, and returned to Akron shortly afterward.

The Goodyear Tire & Rubber Co., Akron, at a meeting of the directorate on January 4 at Cleveland elected to it Vice President and Sales Manager R. S. Wilson, Vice President and Factory Manager C. C. Slusser, and F. H. Ginn to fill the vacancies caused by the resignations of Lord Hugh Trenchard, H. W. O'Melveny, and James T. Begg. Treasurer P. E. H. Leroy was made a vice president also. The Goodyear company is holding a series of divisional conferences for salesmen and branch managers to discuss advertising and merchandising plans. The first was held in Akron on January 15 and 16 for representatives from Cincinnati, Columbus, Detroit, Indianapolis, and Grand Rapids branches. Scheduled speakers were President P. W. Litchfield, Mr. Wilson, Western Division Manager A. J. Sears, Tire Sales Manager J. E. Mayl, and H. E. Blythe, assistant to the president. On January 18 and 19 a conference was held in New York, N. Y., for representatives from branches covering Boston, Hartford, Newark, Philadelphia, Baltimore, and New York areas. Attending the meeting were Messrs. Litchfield, Wilson, Mayl, and Blythe, W. A. Hazlett, manager of Goodyear's eastern division, and other company executives. The Goodyear company was found guilty of infringing the patent of the Overman Cushion Tire Co., New York, and ordered to pay damages. The case will be appealed.

Baldwin Rubber Co., Pontiac, Mich., recently elected the following new directors: C. B. Wilson, formerly president of Wilson Foundry & Machine Co., and Du Bois Young, president of Hupp, and reelected F. L. Given, Samuel G. Clark, Harry M. Pryale, and C. B. Myers. Mr. Clark was renamed president; while Messrs. Myers and Pryale were made vice presidents. C. B. Wilson is secretary-treasurer, and N. B. Eldred, Jr., assistant secretary and treasurer. A proposal to establish a Canadian plant was tabled indefinitely because of present conditions.

PACIFIC COAST

Dealings in rubber goods generally in the Pacific Coast area were in moderate volume during the opening weeks of the year, and prices held up well in garden hose, builders' and miscellaneous mechanicals, druggists' sundries, footwear, and oil well supplies. For the latter there was a noticeable improvement in demand, and there was also a livelier selling of railroad hose and other rubber equipment. Tires were in fair demand, and prices continued low. In fact the market for them further convinced a great many distributers of the unwisdom of the December price cut. A general impression prevails that as much, and perhaps more, business would have been done in January were no reductions made. Meanwhile production of tires is being kept to consumer demand. The general feeling about trade prospects is quite optimistic, but brisk business is not expected much before the middle of March.

The Republic Rubber Co., Youngstown, O., was the successful bidder in a keen competition last month for supplying Los Angeles, Calif., with fire hose. The Republic bid 33½ cents a foot on 43,000 feet of 2½-inch double-jacketed hose and 22½ cents on 7,000 feet of 1½-inch hose with connections, freight and trucking prepaid, delivered in 60 days. Some of the bids on the 2½-inch hose were at 60 cents.

Firestone Tire & Rubber Co. of California, Los Angeles, announces the promotion of Vice President Ross J. Cope to the presidency, leaving Sales Manager R. C. Tucker as vice president. Mr. Cope returned January 20 from New York and Akron, where he had been in conference with the officials of the parent Firestone company. He has been 18 years in the service of the company. The Coast concern finds sales good and is planning to step up production from the present daily output of 6,000 to 8,500 tires during February. The plant is running 4 6-hour shifts daily 5 days a week, giving work to 25% more employes. The battery factory, which is operated in the Xylos reclaiming rubber building on the Firestone premises, is now turning out 450 batteries daily and expects soon to add to the output.

The United States Rubber Co., Samson Division, Los Angeles, Calif., is now running 3 shifts daily and planning for a considerable increase in the present production of 4,000 daily by March 1. A steady gain in sales is reported.

The Pacific Goodrich Rubber Co., Los Angeles, Calif., will have a sales conference in the middle of February at the factory. Tire sales are reported to be picking up steadily, and the new safety tire is taking particularly well.

The Barkerubber Flooring Co., 3146 E. Slauson Ave., Los Angeles, Calif., operated by T. J. Barker, which manufactures rubber flooring, mats, runners, typewriter pads, and other specialties, is very busy. Only scrap inner tubes are used in making the goods, and the stock is reclaimed on the premises. There is said to be no competition in these lines; so the company is selling goods by the ton in New York and many other large centers of the country. The company has just installed a new press for special floor covering and operates daily on a 9-hour shift.

The Gates Rubber Co., Denver, Colo., is enjoying a particularly large trade in battery boxes on the Pacific Coast. The increase in the Southern California section during the past year was 38% over that of 1930 and in mechanical goods, especially railroad hose, 122% increase. It also reports a larger demand for brake lining and general mechanical goods. It has added 2,400 cubic feet to its storeroom at 747 Warehouse St., Los Angeles. The company maintains a large distribution depot in Oakland, Calif. President C. C. Gates, with Mrs. Gates and 2 daughters, are expected on the Pacific Coast in March after making a world tour, which will have taken in the rubber countries of South America and the Far East.

The Goodyear Tire & Rubber Co., Los Angeles, Calif., reports spring dating orders keeping up well with the amount of last year. Daily output is 6,000 tires and the factory is running 3 6-hour shifts 5 days a week. Comptroller C. H. Brook of the parent Goodyear company at Akron, O., was a recent visitor.

The Kirkhill Rubber Co., Hoover St. & E. Saluson Ave., Los Angeles, Calif., is busy 24 hours a day on miscellaneous rubber specialties. The concern recently introduced a novelty on the Coast in the manufacture of white and red tubing and has installed 3 tubing machines for the purpose.

The American Rubber Mfg. Co., Oakland, Calif., is gradually extending its operations, according to Colonel J. L. Dodge, treasurer, and looks forward to a very profitable year.

The India Tire & Rubber Co., through its Pacific Coast Manager, W. R. Wheatly, 460 Ninth St., San Francisco, Calif., reports that K. F. Stadler, formerly in charge of the Sacramento district, has been put in charge of Southern California territory.

The Pioneer Rubber Mills, San Francisco, reports operations at its factory at Pittsburg, Contra Costa Co., both in Calif., steadily picking up. Sales of hose, belting, packing, matting, and general mechanicals are increasing.

The Willard Storage Battery Co. plant at 5700 E. Ninth St., Los Angeles, Calif., will make expansions at once that will cost about $100,000, according to C. H. Starr, vice president and general manager. Plans are being made for considerable production economies. The business of the local factory in 1931 was greater, both in volume and net profits, than that of 1930. An important addition to the factory will be a lead oxide mill with suitable equipment, an acid reclaiming plant, as well as increased administration floor space.

NEW ENGLAND

The Sponge Rubber Products Co., Derby, Conn., manufactures sponge rubber specialties including Bonnie Bouncer balls, bath mats, chair cushions, and sheet sponge. Officers are F. M. Daley, president; Wm. R. Todd, secretary-treasurer; and L. D. Smith, vice president.

The Union Blacking Co. (Bay State Leather Finish Co.) now is at 761 Washington St., Lynn, Mass.

The American Society for Testing Materials, Committee D-13, will hold its spring meeting in Providence, R. I., March 10 and 11. The committee of arrangements includes Kenneth B. Cook, of Manville Jenckes Co., chairman, and David C. Scott, of Henry L. Scott Co.

Tyer Rubber Co., Andover, Mass., reduced wages of its 500 employes 10 per cent.

Flintkote Corp. is a new subsidiary organized in Massachusetts by the Flintkote Co., which is transferring its roofing and industrial emulsion business to the subsidiary. The parent company recently moved its headquarters from Boston to 100 E. 42nd St., New York, N. Y.

Atlantic Tubing & Rubber Co., 1756 Cranston St., Providence, R. I., contrary to a recent report in this journal is not solely owned by William P. Weinstein. The Atlantic Tubing Co. is owner of the Atlantic Tubing & Rubber Co., of which Mr. Weinstein is vice president and assistant treasurer.

The Chatham Mfg. Co., Middletown, and factory at Portland, maker of rubber thread for textiles for only its parent concerns: The Russell Mfg. Co., Middletown, The Ansonia O. & C. Co., Ansonia, and The American Mills Co., Waterbury, New Haven, and Hamden, all in Conn., announces the following changes in personnel. F. P. Jecusco, technical adviser with the company since its start in 1921, succeeds W. D. Lamond, resigned, as general manager. Richard L. Treat, who came to the company in 1921 from the L. Candee Rubber Co., New Haven, is now office manager and agent. The new superintendent is Robert H. Mielke, who prior to joining the Chatham organization in 1921 had previously been with the Glendale Elastic Fabric Co., The Geo. S. Colton Co., and the Easthampton Rubber Thread Co. Winfield Kelsey has entered the Chatham laboratory and technical development department.

The Norwalk Tire & Rubber Co., Inc., Norwalk, Conn., has announced a unique feature in tire construction, the Norwalk Gold Standard Shock Pad, a wall of heat-resisting red rubber built on the inside as an integral part of the tire, which acts as a shock pad and elimi-

FINANCIAL

Reported by *News Bureau*

Firestone Tire & Rubber

Firestone Tire & Rubber Co., Akron, O., reports for year ended October 31, 1931, net profit of $6,028,630 after all charges including $5,665,063 for depreciation which has been charged against operations for the year, interest, taxes, and Liberia development expenditures. After deducting preferred dividends balance is equal to $1.18 a share on 2,250,000 shares of common stock. This compares with net profit a year ago at $1,541,034 after all charges and a deficit of $1,394,113 after deducting preferred dividends.

Consolidated income account for the year ended October 31, 1931, compares as follows:

	‡1931	‡1930	‡1929	1928
Net sales	$113,797,282	$120,015,664	$144,585,804	$125,664,666
Expenses	101,377,865	112,364,530	128,761,132	111,506,727
Operating profit	12,419,417	7,651,134	15,824,672	14,157,939
Other income	1,578,151	1,610,145	844,181	1,276,535
Total income	13,997,568	9,261,279	16,668,853	15,434,474
Depreciation	5,665,063	4,914,656	4,639,792	3,334,027
Interest	1,215,562	1,431,894	2,084,728	1,300,858
Liberia develop. erpenses	300,592	885,298	1,074,218 }	3,233,253
Other deductions	*688,354	*488,297	213,673 }	
Taxes	.....	.....	929,571	494,322
Adj. foreign subsidiaries, net	99,367	.....	.....	.....
Net profit	6,028,630	1,541,034	7,726,871	7,072,014
Subsidiaries dividends	.....	.....	13,951	64,312
Preferred dividends	3,371,904	2,935,147	1,557,164	1,582,232
Common dividends	2,136,521	3,176,075	2,948,280	3,690,280
Surplus	520,205	†4,570,189	3,189,476	1,735,190

*Includes United States and foreign income taxes. †Deficit. ‡Includes foreign subsidiaries; in 1928 and 1927 only subsidiaries in United States included.

Balance sheet as of October 31, 1931 shows current assets of $56,510,281; current liabilities, $4,965,902; and working capital $51,544,379. This compares with working capital of $52,230,623 on October 31, 1930. As of October 31, last, cash amounted to $11,776,774, and inventories $29,134,422, compared with $12,275,352 cash and $27,548,987 on October 31, 1930.

Mohawk Rubber Co.

Mohawk Rubber Co., Akron, O., preferred shareholders at the annual meeting on February 8 will find for their vote a resolution providing for modification of bond payments and extension of maturities of bond and bank indebtedness.

Pennsylvania Rubber Co.

Pennsylvania Rubber Co., Jeannette, Pa., stockholders at a special meeting fully and promptly subscribed to an issue of 20,000 shares of first preferred stock at $100 a share and subject to a 6% dividend. This money will provide additional capital and strengthen materially the financial structure of the company.

Dayton Rubber Co.

Dayton Rubber Co., Dayton, O., according to a recent announcement by President J. A. MacMillan at a special meeting on February 15 will ask its stockholders to approve recapitalizing the company.

Lee Rubber & Tire Corp.

Lee Rubber & Tire Corp., Conshohocken, Pa., reports for fiscal year ended October 31, 1931, net loss after all charges including interest, depreciation, and inventory adjustments, of $625,100, compared with net loss in the preceding fiscal year of $799,111. Inventory write-down at the close of the 1931 year was $434,811, against $605,196 the year before. Net sales totaled $6,768,461, against $8,654,847 in the preceding year.

Balance sheet as of October 31, last, showed current assets of $3,840,905, including $660,222 cash and $1,650,793 inventories. Current liabilities amounted to $949,812, including $700,000 bank loans, leaving working capital of $2,891,093. Cash in banks in possession of State banking departments totaled $20,276. A year ago, current assets totaled $4,801,280, including $788,714 cash and $1,712,953 inventories. Current liabilities amounted to $1,299,089 including $950,000 bank loans, leaving working capital of $3,502,191.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Collyer Insulated Wire Co	Com.	$0.12½ q.	Jan. 1	Dec. 24
Faultless Rubber Co	Com.	$0.62½ q.	Apr. 1	Mar. 16
Firestone Tire & Rubber Co	A Pfd.	$1.50 q.	Mar. 1	Feb. 15
General Tire & Rubber Co	Com.	$0.25 q.	Feb. 1	Jan. 26
Goodyear Tire & Rubber Co	Com.	$0.25 q.	Feb. 1	Jan. 15
Plymouth Rubber Co	Pfd.	$1.75 q.	Jan. 15	Jan. 2
Stedman Rubber Flooring Co	Pfd.	$1.75 q.	Jan. 2	Dec. 26

nates the possibility of blowouts that cause so many accidents. Norwalk also manufactures rubber air cushions, door silencers, cowl protectors for gasoline tanks, fender flaps, and coasters for drinking glasses. G. E. Maurer is advertising manager.

Costello C. Converse's will, providing for several public bequests, was recently allowed by the Suffolk Probate Court. The estate, totaling about $7,100,000, has the Boston Safe Deposit & Trust Co. as executor. Mr. Converse was a pioneer rubber manufacturer, well known in the trade for many years.

Sanford Mills, Sanford, Me., has developed a rubber and mohair shoe welting designed to prolong the life of the shoe and to give a storm welting with greater flexibility and improved waterproof qualities.

Hood Rubber Co., Watertown, Mass., division of The B. F. Goodrich Co., for 4 weeks beginning January 16, closed its heavy footwear manufacturing department because of the most unseasonable weather. This shutdown involves 40% of the manufacturing capacity and from 400 to 500 of the 3,200 employes.

Holstein Rubber Co., Danbury, Conn., manufacturer of rubber tile floor covering, recently filed a bankruptcy petition in the United States District Court, New Haven, Conn., listing liabilities at $110,383 and assets at $21,905.

Devon Mills, unit of The Goodyear Tire & Rubber Co., New Bedford, Mass., recently returned from a 4-day to a 5-day schedule, maintaining, however, its 3 shifts daily. Superintendent L. S. Hall had as his guests C. C. Slusser, vice president and general manager, Edward Thomas, assistant factory manager, and S. A. Steere, manager of the cotton and fabric division, all of the parent company in Akron, O. Mr. Hall expects the mill to continue the 5-day schedule throughout the Winter and then adopt a 6-day program.

Boston Shoe Show

The Tenth Annual National Boston Shoe Show, Boston, Mass., on January 11, 12, and 13 featured exhibits by several rubber companies, including E. H. Clapp Rubber Products Co., Boston; Dewey & Almy Chemical Co., Cambridge; Moulded Rubber Co., Taunton; Panco Rubber Co., Stoughton; Panther Rubber Co., Chelsea; and Quabaug Rubber Co., North Brookfield.

Among the rubber men registered at the show were Carl A. West and D. C. Cochran, United States Rubber Co.; Samuel Brockman, Ladatex Sole Co.; Harry A. Martin, Max and Sam Brown, Mathew Greenford, B. A. Landisman, and Matthew Greenfield, all from the Moulded Rubber Co.; Warren R. Dow, Hood Rubber Co., Watertown; and John S. Clapp, E. H. Clapp Rubber Products Co.

Rubber soles and heels, in anticipation of summer sport shoes, were displayed by most concerns. Dewey & Almy showed Darex soles and heels of thick felt impregnated with latex and compressed to ¼ of the original volume. The E. H. Clapp Rubber Co. exhibited a new rubber sole for women's shoes, which can be attached either by stitching or cement to smart street footwear of the dressier type and is no more conspicuous than leather soles. The Moulded Rubber Co. also showed a new line of soles and heels, under the direction of Harry Layboldt.

Tennis footwear was featured by several shoe companies. Chief among them was A. L. Baris, of the Wm. Brown Shoe Co., Haverhill, Mass., who did a rushing business. Because of the increasing popularity of sports in general, a keen interest was shown in all tennis and sport footwear.

There were few signs of depression about the Boston Shoe Show; it was well attended and a satisfactory number of orders came in. Rubber men admitted, that, while the peak of 1929 was a long way off, business in general appeared better than a year ago.

EASTERN AND SOUTHERN

Harvey S. Firestone, Jr., of The Firestone Tire & Rubber Co., Akron, at a meeting of the international committee of the Young Men's Christian Association on January 19 at New York, N. Y., was elected a member of the committee.

National-Erie Corp., Erie, Pa., has announced a new line of Rapido tubing machines, which incorporates many improvements and features resulting in far greater production. The company also reports a good volume of all-steel hydraulic platen presses now going through the plant, and recently shipped several mill units to a large customer in the East.

The New York Rubber Corp., Airubber Dept., Beacon, N. Y., has won a second contract from the United States Navy calling for 141 7-man and 50 1-man air boats for standard equipment on seaplanes. Although these Airubber boats are of the design developed originally for sportsmen's use, the method of inflation is quite different. The Navy's boats are equipped for inflation by the new Lux system, consisting of a "CO_2 bottle" with valve and connection assembly, by which the boat is inflated instantaneously with carbon dioxide or liquid air. Additional inflation features are inflatable seats and a foot-pump for inflating them and for use as an emergency inflator for the boat itself in case a CO_2 bottle is lacking. The Airubber design of air boat consists of 2 separate air chambers for the pontoons of the boat. Thus, in an airboat with 2 seats, which are made to inflate, are 4 separate air chambers, insuring a very high degree of safety. If a slip-in inflatable floor is used, an additional safety factor is acquired. The company now is making these boats in 3 additional sizes for sports use.

The Goodyear Tire & Rubber Co., Akron, O., recently purchased property at E. Water and S. Townsend St., Syracuse, N. Y., on which the company will erect a 4-story building to serve as headquarters for central New York State. Demolishing the old buildings on the site has already begun.

The Edward G. Budd Mfg. Co., Philadelphia, Pa., recently announced that it had contracted with Michelin & Cie. of France for rights in this country to the Michelin pneumatic tired railway car.

Hanover Rubber Co., Excelsior, Inc., 315 Fourth Ave., New York, N. Y., of which E. Bittner is manager, is the sole agent in the United States and Canada for the Continental Rubber Works of Germany.

Turner Halsey Co., handling osnaburgs and tire fabrics, moved its New York, N. Y., office to the ninth floor of The Merchants' Square Building, 40 Worth St. Telephone, COrtlandt 7-0700.

General Electric Co., Schenectady, N. Y., announced the appointment as manager of the publicity department of Chester H. Lang, former assistant manager of publicity and then comptroller of the GE budget. He succeeds Martin P. Rice, who retired December 31 after having been with the company 37 years.

The L. H. Gilmer Co., Tacony, Philadelphia, Pa., manufacturer of V-belts and other types of power transmission belting, recently concluded its regular annual factory conference attended by over 50 men including field salesmen, engineers, and department heads. Constructive plans were completed for increased cooperation between the factory and all sales representatives to make 1932 an even better year for the company than 1931, during which definite progress was made in finding increased application for Gilmer products together with a much broader distribution.

Imperial Oil & Gas Products Co., Pittsburgh, Pa., has completed a new laboratory at its Sterlington, La., factory, to be used exclusively for testing carbon black in rubber compounds. R. W. Sanford, formerly chemist with The B. F. Goodrich Co., Akron, O., is in charge of the laboratory and will supervise all tests in furtherance of Imperial's expanded program of technical development.

The Darcoid Co., Inc., 179 Christopher St., New York, N. Y., manufactures red rubber, wire inserted red rubber, canvas inserted rubber, and pure gum rubber. Officers are W. F. Glimm, president; H. Cole, vice president; H. Streicher, secretary; and E. E. Edgcumbe, treasurer.

Charles B. Chrystal Co., Inc., importer and grinder of minerals, clays, and colors, has moved from 11 Cliff St. to 11 Park Pl., New York, N. Y. Officers are Charles B. Chrystal, president and treasurer; John Ormiston, vice president; and C. E. Alexander, secretary.

The Belmont Packing & Rubber Co., Butler and Sepviva Sts., Philadelphia, Pa., and branch office at 200 Church St., New York, N. Y., manufacturer of mechanical packings, with profound sorrow announced the death on January 2 of its treasurer, Fred Paul Sher. Present executives are Geo. C. Gillies, president and treasurer; O. W. Wagner, vice president and secretary; and M. J. Whalen, purchasing agent.

NEW JERSEY

Some New Jersey rubber companies reported decreased business during the past month; while others found trade good for certain products. Orders have increased for automotive supplies and hose for gasoline stations. Plants making brake lining experienced a gain in orders; while the production of rubber cloth for automobiles increased. The hard rubber situation is not satisfactory. Tire and tube plants are running below normal, but the shoe and heel industry remains fairly good.

All the rubber manufacturing concerns in Trenton have signed a taxpayers' petition asking that a tax cut be made to help stabilize business. The petition was circulated when taxes were to be increased.

David Shirk, president of the Rare Metal Products Co., Belleville, recently sailed on a trip via the Panama Canal to Honolulu, Hawaii, and possibly China.

Weldon Roberts Rubber Co. recently moved from 18-26 Oliver St. to new and larger factory and office quarters at 351-65 Sixth Ave., Newark.

The Thermoid Company, Trenton, is very busy making automotive supplies. President Robert J. Stokes was on an extensive western and southern trip.

Fred S. Wilson, former Thermoid vice president and Pacific Coast manager, is visiting in Trenton. Mr. Wilson is now industrial adviser of the city of Santa Monica, Calif. Mr. Wilson was with Thermoid 30 years. He began as a bicycle tire maker when but 16 years old and later became factory manager and sales manager. After leaving the rubber company he took up oil refining in Los Angeles.

Home Rubber Co., Trenton, lowest bidder for the supply of 3,000 feet of hose for the Fall River, Mass., Fire Department, has won the contract.

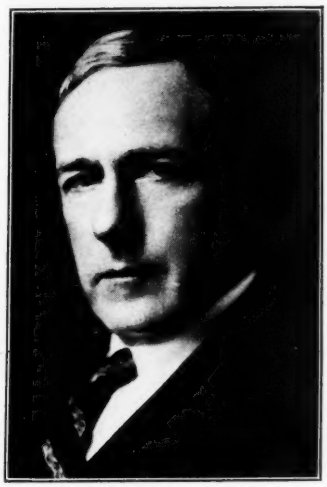
Horace T. Cook, president of the Hamilton Rubber Co., Trenton, was on an extended southern trip with Mrs. Cook.

Pierce-Roberts Co., Trenton, finds business declining, but the concern still maintains the same number of employes.

Joseph Stokes Rubber Co., Trenton, receiving many inquiries from wholesalers, believes that business will improve in the Spring. At present the concern is operating normally both at the Trenton and the Canada plants. The company has been granted a tax refund of $3,985.16 from the Federal Government.

Whitehead Bros. Rubber Co., Trenton, with business fairly good in all departments, stated that officials feel very much encouraged over the future outlook.

Murray Rubber Co., Trenton, which closed for three weeks in December to take inventory, has resumed operations. The company expects to produce 1,000 tires daily. John Manser, of Lexington, Ky., has been appointed agent to cover the Kentucky and Indiana territory in place of Samuel Sherill, resigned.



Blank & Stoller, Inc.

C. H. Oakley

Rose from Railroader to Rubber Manufacturer

That engineering is a profession which fits a man to change successfully to a vocation quite dissimilar from that in which he originally started is well exemplified in the case of Clifford H. Oakley, president of the Essex Rubber Co., Trenton, N. J. Born in October, 1869, in Cleveland, O., and educated in the Cleveland and the Ashtabula, O., public and evening technical schools, he became a mechanical draftsman, motive power department, Erie Railroad, in 1887. He was promoted in the same year and served 4 years as junior engineer, maintenance of way department, of the railroad.

In 1892 rubber lured him from the outdoor work; so he became a mechanical draftsman for the Cleveland Rubber Co. In the same year he was advanced to the post of superintendent, remaining in that position until 1893, when he became superintendent of an allied concern, the New York Belting & Packing Co., Passaic, N. J., for 2 years. Returning to Cleveland, he became general superintendent of the Cleveland Rubber Co., 1895-1900. Next the Grieb Rubber Co., Trenton, N. J., claimed his services as general manager, 1900-1907, and during that time he was instrumental in effecting the consolidation at Trenton of the Ajax Rubber Co. of New York and the Grieb company.

Manufacturing on his own account next attracted Mr. Oakley, and in 1907 he founded the Essex Rubber Co. in Trenton. From modest beginnings the business of making insulating material, brake lining, packings, automobile accessories, and numerous specialties has since grown to remarkably large proportions under his continuous control as president and general manager.

Keenly interested in community welfare, Mr. Oakley has been one of the most active officials of the Trenton Chamber of Commerce, is a member of the Rotary Club of Trenton, has been a director of the New Jersey Manufacturers Association, and is a long-time member of the American Society of Mechanical Engineers. He is a Shriner and prominent in Masonic circles.

Pocono Rubber Cloth Co., Trenton, has been busy filling orders for automobile cloth.

Mercer Rubber Co., Hamilton Square, finds that business has not improved during the past month.

Luzerne Rubber Co., Trenton, reports a decided decrease in hard rubber production. C. Dudley Wilson, vice president and treasurer, has been spending some time with his family in Windsor, Conn.

Raritan Rubber Co., New Brunswick, has leased its plant to the Royal Battery Co., manufacturer of battery boxes. The former owners of the rubber plant have incorporated with other interests and leased another building.

Youngs Rubber Corp. of New Jersey, Trenton, manufacturer of rubber specialties, suffered $100,000, from damage by fire on January 25, and 150 employes temporarily lost their jobs. The fire, which started from a spark, was followed by a series of explosions as benzol, naphtha, and rubber cement in tanks became ignited. The 24-hour blaze destroyed the dipping room, but no employes were burned. The shipping and packing departments, also were saved from damage. President Arthur M. Youngs announced that the plant will be rebuilt immediately.

Institutional Casters

Where quiet is essential, especially in a hospital, the Darnell Institutional Caster will prove a blessing in disguise. Advantages of this accessory are, it provides ease of movement and full protection of floors and also eliminates damage to equipment from wracking.

These casters use only hardened and ground-to-size Hoover steel balls. All wearing parts, moreover, are fully hardened by the carbonizing process. The double ball-bearing swivel is an outstanding feature of these casters. This swivel consists of an upper row of hardened ball bearings to carry the load, and a lower row to take up all offset or lateral strain. All balls run in hardened races. The rubber tires also constitute an important feature. The casters come in several sizes, all aluminum lacquer over cadmium plate, to meet every requirement.

For beds requiring extension stem casters the manufacturer provides such an extension in a variety of sizes and types to fit almost any hospital bed.

All Darnell casters with a three-inch or larger wheel may be equipped with brakes of the positive type, with a pin through the wheel and the yoke. Four-inch wheel casters may have foot-operated brakes, which lock against the wheel sides. Darnell Corp., Ltd., Long Beach, Calif.

CANADA

Sponge rubber mats recently put on the market come in futuristic designs in a variety of color combinations and are 15 by 24½ inches. Manufacturers report a comparatively good volume of booked orders for garden hose up to the end of 1931 although from certain districts ordering was lighter than in 1930. Prices for the new year have not changed. On orders booked prior to January 1, 1932, prices are guaranteed against decline until June 30, 1932. On shipments made between January 1 and June 30 invoices will be payable on July 10, less 2 per cent, or net July 31, 1932.

Few men's overshoes were sold during the holiday season because of the unseasonable weather. December was a poor month, generally speaking, for the sale of men's overshoes, although sales were good for women's. Unless severe weather sets in, the present winter season probably will not see a large sale of men's overshoes or heavy rubbers. Sale of low rubbers during the past 3 months has been fair but not out of the ordinary. A report from the Maritime Provinces states that in Halifax women's overshoes laced to the toes, in both black and brown, were considerably short of requirements and many more could have been sold had they been in stock. December sales were mostly for gifts. Perhaps the demand for women's black velvet or Jersey overshoes was the most striking sales feature of the period.

The Canadian Trade Exhibition left Halifax, N. S., January 8, with Canadian exhibits and representative Canadians, on a 2-month cruise with stops at Bermuda, the British West Indies, British Guiana, and the Bahamas. Over 50 Canadian firms took advantage of this opportunity for export expansion. Representing the rubber industry are: Dominion Rubber Co., Ltd., Montreal; Miner Rubber Co., Ltd., Granby; Gutta Percha & Rubber, Ltd., Seiberling Rubber Co. of Canada, Ltd., and Durable Waterproofs, Ltd., all of Toronto.

Gutta Percha & Rubber, Ltd., Toronto, Ont., has adopted a 24-hour production schedule.

Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ont., has returned to a full schedule of 24 hours a day, 5 days a week, to increase production 25 per cent. In making this announcement, D. J. McCarthy, general sales manager, revealed that the company's business for the final quarter of 1931 equaled the previous all-time record for a like period made in the boom year of 1929. Mr. McCarthy considers this report an indication of renewed activity in automotive circles and predicted that 1932 will be an active year for producing motor cars and accessories.

J. Ross, rubber footwear salesman, formerly with Ames Holden McCready Rubber Co., Ltd., recently joined the Northern Rubber Co., Ltd., Guelph, Ont., to cover Northern Ontario and part of the City of Toronto, along with E. A. Edmonds, who has represented Northern for the past 4 years, both in the City of Toronto and throughout Central Ontario.

Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont., held its annual Christmas tree party, attended by several hundred employes, their families, and friends. Each youngster received a gift and a bag of novelties. Refreshments were served. The affair was under the direction of D. J. Huether, superintendent of the pneumatic tire division. J. E. Jones, sales manager, Dunlop mechanical division, states that the company is looking forward this year with optimism because forward bookings indicate that 1932 will be a big year for sporting goods.

Dominion Rubber Co., Ltd., Montreal, P. Q., reports that the Kamp Sole for leather shoes, the newest member of its Uskide line, is being readily accepted by leading shoe manufacturers in all parts of Canada. The new sole has many talking points. Its greater flexibility gives far more comfort. Being tougher, it wears longer; while its better appearance gives additional style to the shoe. Because it is sewn on, production costs are materially lowered.

W. A. Eden, Dominion president, in the Commercial & Financial Review, 1932, section of the *Montreal Gazette* in an article, "Rubber Industry Expects Good Sales Volume for 1932," says:

"Having weathered 2 years of depression . . . . the rubber industry of Canada goes forward to meet 1932 constructively organized for improved business. It has: 1. Materially reduced inventories. 2. Steadily simplified lines in footwear and mechanical goods. 3. Cut distribution costs by improved methods of merchandising.

"Today in Canada the selling price of rubber . . . . products . . . . is the lowest in history. . . . . The consumer . . . . is offered a . . . . bargain market. Not only have prices dropped but aggressive competition has measurably improved products. . . . .

"I look to 1932 with confidence because I believe a public buying movement to be inevitable, because I believe the peak of depression has passed . . . . And there is no doubt that industrial Canada will benefit in its turn from Britain's abandonment of free trade and anticipated adoption of an Empire preference.

"The outlook for the domestic market is good. In the tire field, the universal anticipation of better business in 1932 by the leading motor and truck manufacturers on this continent gives us reasonable cause for optimism. . . . .

"In the field of rubber footwear and mechanical goods, prices have reached a point where even those on the most restricted incomes can afford to buy. But aside from the low-price factor, there is the fact that a considerable volume of both consumer and industrial buying cannot be deferred much longer. . . . . In view of the curtailed buying of 1930 and 1931. . . . . Replacement business in 1932 should show very good business indeed."

A. J. Minister, manager of footwear sales, Canadian Goodrich Co., Ltd., Kitchener, Ont., in a recent interview declared that many problems confront the rubber shoe manufacturer, but none is quite so important as service. To achieve this end the company during the past year adopted a policy of consolidation and concentration that effected important economies which it passed along to its customers. Instead of carrying footwear stocks in the Province of Ontario at London, Hamilton, Toronto, and Kitchener, Goodrich concentrated just one stock at Kitchener. A teletype installation connecting the Kitchener and the Toronto offices enables every order received in the latter office to be received by the former in a few minutes, effecting speedy delivery of the goods.

Greetings, Calendars, and Souvenirs

The staff of INDIA RUBBER WORLD gratefully acknowledges the following holiday souvenirs:

A combination magnifying glass, letter opener, and rule was the very serviceable and appreciated remembrance of The Akron Equipment Co., E. Exchange St., Akron, O.

Pocket memorandum books containing information and maps of value were provided by General Electric Co., Schenectady, N. Y.; John Royle & Sons, Paterson, N. J.; and E. T. Trotter & Co., 576 Johnson Ave., Brooklyn, N. Y.

F. O. Holbrook, as his holiday greeting, sent a souvenir booklet containing 29 fine views of Sydney, Australia.

Beautiful cards containing appropriate Christmas and New Year greetings were received from The Cleveland Liner & Mfg. Co., Cleveland, O.; Davol Rubber Co., Providence, R. I.; John Robertson Co., Inc., 131 Water St., Brooklyn, N. Y.; Ibrahim I. Saad & Fils; Wm. H. Scheel, 179 Water St., New York, N. Y.; R. F. Snyder, of The B. F. Goodrich Co., both of Akron; and James H. Steadman, 5550 Cote St. Luc Rd., Montreal, Canada.

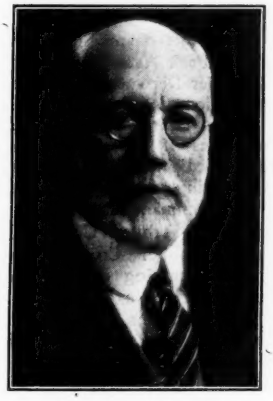
Artistic and useful calendars were forwarded by T. C. Ashley & Co., 683 Atlantic Ave., Boston, Mass.; Automatic Temperature Control Co., Inc., Philadelphia, Pa.; Ferriott Bros., Inc., 941 Yale St., Akron; Fremont Tool & Die Co., 432 N. Wood St., Fremont, O.; General Electric Co.; Lockwood Green Engineers, Inc., 100 E. 42nd St., New York; The Oak Rubber Co., Ravenna, O.; R. W. Rhoades Metaline Co., Inc., 62 West Ave., Long Island City, N. Y.; The Rubber Service Laboratories Co., Akron; E. T. Trotter & Co.; Link-Belt Co., Chicago, Ill.; and Woburn Degreasing Co., 110 E. 42nd St., New York.

OBITUARY

Veteran Rubber Man

ON JANUARY 13 at his home in Toronto, Ont., Canada, Charles Newton Candee, president of Gutta Percha & Rubber, Ltd., died in his sleep. Mr. Candee, born of a family for generations associated with the rubber industry in the United States, began his connection in 1879 as a clerk in the wholesale and retail rubber establishment of O. W. Clary, Syracuse, N. Y. In 1886, however, he was appointed assistant manager of the Gutta Percha & Rubber Mfg. Co. In 1889 he was made secretary. When the company was reorganized, January 1, 1913, he became managing director and vice president. On February 29, 1916, he ascended to the presidency, retaining the post of managing director, which he relinquished in 1928. Mr. Candee had served also as president of The Winnipeg Rubber Co., Ltd., and Vancouver Rubber Co., Ltd., and as treasurer and director of the Toronto Rubber Co., Ltd. In May of last year he was elected president of Kirkland Lake Gold Mines, Ltd.

Although the veteran manufacturer was



Charles N. Candee

born on March 2, 1860, in Rochester, N. Y., he became a naturalized British citizen following his association with the Toronto concern.

The name of Charles N. Candee appeared on the roster of many organizations, including the Canadian Manufacturers and the Ontario Anglers Associations; York, Toronto, Royal Canadian Yacht, and St. Anne's Fishing clubs; St. Andrew's Masonic Lodge; Toronto Board of Trade; Toronto Conservatory of Music, and Royal Colonial Institute, London.

Surviving are his son and 3 daughters.

Goodrich Superintendent

EDWARD C. STONER, 45, production superintendent of the tire division of The B. F. Goodrich Rubber Co., died in Akron, O., January 2 following an operation 2 weeks before for spinal meningitis.

He was production superintendent one year. He joined Goodrich in 1910 as a bead curing room employe and soon advanced to foremanship of the department. In 1927 he was made process engineer of the division. Three years later Mr. Stoner became a vice president of the company.

Burial was in Stow Cemetery on January 6 after services in the Stow Church of Christ. Surviving are his widow, 5 daughters, and a brother.

INTERESTING LETTERS

Some Facts about Masking Tape

TO THE EDITOR: In your November 1, 1931, issue, there is an article on masking tape which states, "Neither ordinary zinc oxide rubber adhesive tape nor gummed paper tape is satisfactory because both are not only difficult to remove but also leave on the covered surface some of their adhesive, which in being removed tends to mar the finish of the underlying area." This statement is not true because many hundreds of thousands of yards of such material is being used in the automotive industry today.

Johnson & Johnson are manufacturers of cloth backed masking tapes with ordinary zinc oxide rubber adhesive on the surface. The larger producers of cars in this country, as well as many hundreds of repaint shops, purchase this material and use it in preference to paper tape. We do not mean to imply that paper tape is not a good article but we do not like the inference in this article to the effect that cloth backed tapes with a zinc oxide adhesive are unsatisfactory. On an average, cloth backed tapes can be used more times than paper tape.

In the article referred to you state, "Paper is cheaper than cloth and does not stretch." The paper tapes which are on the market today are sold at equal or higher prices than cloth tapes, and inasmuch as the paper contains considerable crepe, it has more stretch.

These facts are brought to your attention so that the impression which you have unquestionably created with the users of masking tape—that the only satisfactory product to use would be paper—might be properly corrected. We fully realize that a publication cannot be expected to specialize in all lines of endeavor and consequently some false impressions are created. However, we are very sure that you would like to know the true facts of the case.

JOHNSON & JOHNSON
F. N. Manley
Industrial Division

New Brunswick, N. J.,
January 20, 1932.

Zinc Stearate Non-Poisonous

TO THE EDITOR: In the article "New Rubber Dusting Material" on page 51 of INDIA RUBBER WORLD, December 1, 1931, appears the statement, "The objection to zinc stearate is its toxic quality, which prevents its use for dusting."

It is my opinion that this statement is contrary to the facts.

From a reasonably long and intimate acquaintenance with all of the principal products of zinc, their manufacture and their uses, I feel qualified to state zinc stearate is a non-poisonous material. My judgment in this matter is confirmed by well recognized authorities, both in and out of the rubber industry. For instance, Dr. Cecil K. Drinker, Professor of Physiology, School of Public Health, Harvard University, has expressed his opinion that a statement recently made in a foreign journal to the effect that zinc stearate was a poisonous material is "wholly erroneous."

Likewise P. A. Davis, A.B., M.A., M.D., Assistant Medical Director, Goodyear Tire & Rubber Co., in an article entitled, "Toxic Substances in the Rubber Industry," Part VII, *Rubber Age*, January 25, 1930, states:

"Of all the substances used in the rubber industry we are less concerned with zinc than any of them, as we consider zinc and its compounds non-toxic, and the only ones we issue warnings against are the soluble zinc chloride and sulphate, for these, in solutions, cause burns and blisters and occasionally a dermatitis."

I think there is a general agreement that the inhalation of large draughts of finely divided dust particles (including zinc stearate) of admittedly non-toxic quality, has occasioned serious results, by causing a clogging of the fine air passages of the lungs, but the action has been mechanical and not that of a poison.

As the best proof of the accuracy of the opinions given, I would call your attention to the fact that zinc stearate has been used for a number of years and is now being used in large quantities as a dusting powder by the rubber industry.

BRUCE R. SILVER
Manager Technical Service
The New Jersey Zinc Sales Co., Inc.

New York, N. Y.,
December 30, 1931.

EDITOR'S BOOK TABLE

Book Reviews

"Rubber Producing Companies." Compiled by The Mincing Lane Tea & Rubber Share Brokers' Assn., Ltd., London, England. 1931. Published by *The Financial Times*, Ltd., 72 Coleman St., E. C. 2.

This standard work of rubber companies follows the lines of previous editions. The authentic and exhaustive information listed concerning over 600 companies includes capital, acreage, latest accounts, crops, purchase price, dividends, forward sales, estimates, etc. Directors and secretaries are listed.

"Proceedings of the Thirty-fourth Annual Meeting." This meeting was held at Chicago, Ill., June 22-26, 1931. Vol. 31, Parts I and II. American Society for Testing Materials, 1315 Spruce St., Philadelphia, Pa. Cloth. Illustrated, subject and author indices. Part I, 1,119 pages; Part II, 1,027 pages.

Part I contains the annual reports of the Society Committees, and the papers and standards appended. In this part of the 1931 proceedings are reports of 42 standing and research committees and reports of one joint and 2 sectional committees. Of special interest to the rubber industry are tentative specifications for rubber products, textile materials, and methods for the chemical analysis of rubber products.

Part II comprises the technical papers given at the annual meeting of the Society in June, 1931. The abrasion testing of rubber is a subject of interest to all producers and users of rubber and rubber products. A symposium on this subject is given in this volume. Comprising 60 pages it covers such subjects as tear resistance of rubber compounds, abrasion tests of these compounds, and a comparison of the tests made on several types of abrasion machines.

"Men Working. A story of The Goodyear Tire & Rubber Co." Norman Beasley. Harper & Brothers, Publishers, New York and London. 1931. 296 pages. Indexed. Illustrated.

This story of The Goodyear Tire & Rubber Co. is most interestingly and vividly told. In fact it is alive with action. The reader at the start gains a glimpse of the inception of the rubber industry that bears such important relations to modern methods of automotive transportation. Interest in the story becomes absorbing as the author reveals one after another the critical situations that arose in affairs of the company and shows the masterful way in which they were handled and the company saved to become a leader in the rubber industry. The ability and the foresight of the Goodyear company management is reflected in the rapidly expanding interests of the company in rubber planting, cotton growing and manufacturing, and tire and lighter-than-air ship building. "Men Working" is replete with interest.

New Publications

The Vanderbilt News. R. T. Vanderbilt Co., 230 Park Ave., New York, N. Y. The November-December, 1931, issue of this publication is devoted entirely to Kalite. The nature, physical properties, and advantages of this new rubber compounding ingredient are given. Its value as a resin forcing material is illustrated by tests in many commercial stocks.

"Mechanical Rubber Craft," Catalog F. Lavelle Rubber Co., Chicago, Ill. This indexed catalog of 44 pages pictures and describes a full line of plumbers' rubber sundries, tubing, perforated mats, matting, and a large variety of molded mechanical specialties.

"Sunruco Rubber Office Specialties." Sun Rubber Co., Barberton, O. This loose-leaf 8-page catalog contains attractive illustrations in color and detailed descriptions of useful rubber products suitable for the office, such as furniture shoes, cushions, sponges, pads, finger cots, etc.

"Facts and Figures of the Automobile Industry." 1931 Ed. National Automobile Chamber of Commerce. This annual statistical summary of the automobile industry contains the figures for 1930. Within the scope of this indexed booklet of 96 pages one can find tabulated the pertinent facts of the leading industry of the United States in all its ramifications. The publication is indispensable as the official source of statistical data on every phase of motor transportation.

"Ratgeber für den Einkauf Technischer Gummiwaren." ("Adviser for the Purchase of Mechanical Rubber Goods"). Continental Caoutchouc Co. G. m. b. H., Hannover, Germany. By giving the mechanical rubber goods dealer essential facts and valuable hints concerning uses, dimensions, construction, and storage of mechanical goods most in demand, this handy 48-page booklet facilitates both the purchase and the selling of Continental goods by the dealer. The value of the publication is enhanced by a number of illustrations and an index.

"Principles of Patent Law for the Chemical and Metallurgical Industries." By Anthony William Deller. 1931. The Chemical Catalog Co., Inc., 419 Fourth Ave., New York, N. Y. Cloth, 483 pages, 6 by 9 inches. Indexed. Illustrated.

The reader interested in acquiring dependable information on the numerous questions that arise in connection with patents, particularly in the fields of chemistry and metallurgy, will find in this work answers for every phase of his inquiry. The book is invaluable for reference and should find a place in every research laboratory.

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

Number	Commodity	City and Country
†54,829	Bathing caps	Milan, Italy
*54,830	Shoe finders' goods, soles, and heel cushions	Gustrow, Germany
†54,857	Surgical goods	Krakow, Poland
†54,898	Boots	Paris, France
†54,952	Soles and heels	Waalwijk, Netherlands
*†54,979	Tires, tubes, accessories, and vulcanizing materials	Para, Brazil
*†54,980	Surgical articles and sponges	Warsaw, Poland
*54,987	Surgical goods	Toronto, Canada
*55,001	Thread	Toronto, Canada
†55,049	Automobile mats	Oslo, Norway
*55,064	Belting	Madras, India
†55,072	Balls	Halifax, Canada
†55,119	Insulating material	Milan, Italy
‡55,142	Gloves, nipples, aprons, carpets, etc.	Milan, Italy
*†55,146	Tennis balls	Prague, Czechoslovakia
*†55,161	Sanitary goods	Rosario, Argentina
†55,162	Bathing caps and gloves	Milan, Italy
†55,163	Druggists' sundries and hospital and surgical goods	Rome, Italy
†55,164	Heels	Habana, Cuba
†55,170	Sport goods	Prague, Czechoslovakia
*†55,201	Footwear, heels, soles, mechanical goods, surgical and druggist sundries, hospital sheeting, toys, bathing caps, pants, bibs, aprons, dress shields, molded goods, mats, and hard rubber specialties	Casablanca, Morocco
*†55,226	Tires and tubes	Carlsbad, Czechoslovakia
*55,288	Rubberized cambric	Zagreb, Yugoslavia
†55,292	Druggists' sundries	Montreal, Canada
*55,294	Battery containers and covers	Calgary, Canada
†55,327	Toys	Curacao, Netherland West Indies
†55,359	Rubberized cloth, novelties, and other articles	Mexico City, Mexico
†55,389	Prophylactic hospital goods and sundry supplies	Buenos Aires, Argentina
†55,390	Tires	Stuttgart, Germany
†55,409	Soles	Barcelona, Spain
†55,418	Bathing caps	Bridgetown, Barbados
*55,458	Sponge rubber	Winnipeg, Canada
‡55,459	Erasers and rubber bands	Berlin, Germany
†55,501	Pharmaceutical goods	Buenos Aires, Argentina
†55,502	Tires	Santiago, Chile
†55,503	Soles	Madrid, Spain
†55,541	Balloons and footwear	Piraeus, Greece
†55,542	Mats	Montreal, Canada
†55,543	Tennis shoes and boots	Milan, Italy
†55,557	Tires	Birmingham, England
†55,580	Druggists' sundries	Montreal, Canada
‡55,617	Surgical goods	Cassel, Germany
†55,745	Overshoes	Konigsberg, Germany
†55,746	Balloons	Calcutta, India
†55,747	Inflated dolls	Prague, Czechoslovakia
*55,748	Sheet rubber	Toronto, Canada
*†55,754	Tennis balls	Rio de Janeiro, Brazil
*†55,768	Tires and tubes	Carlsbad, Czechoslovakia
†55.858	Tires	Prague, Czechoslovakia
†55.895	Heels	Port au Prince, Haiti
†55,896	Balloons, waist belts, horn bulbs, toys, etc.	Bombay, India
†55,897	Overshoes	Milan, Italy
†55.898	Heels and soles	Rome, Italy
†55.949	Rubberized raincoat fabrics	Paris, France

*Purchase. †Agency. *†Purchase and agency. ‡Either.

Rubber Industry in Europe

GREAT BRITAIN

New Insulating Material

Details of a new insulating material called K-Gutta, intended especially for modern high-speed submarine telegraph and telephone cables, have been published by J. N. Dean in a recent issue of *India Rubber Journal*. K-Gutta is a mixture of 60 to 70% of hydrocarbon from gutta percha or balata or both, with 30 to 40% of purified petroleum jelly stabilized with an antioxidant.

Since petroleum jelly has an exceptionally low dielectric constant and conductance, the mixture has superior values to those of the gutta hydrocarbon. The dielectric constant of K-Gutta is 2.5. It has a conductance of less than 10 to 12 ohms per centimeter cube, measured under sea-bottom conditions. Tests further show that while a sample of ordinary cable gutta percha immersed in 3.5% salt solution became constant in weight about 30 days after immersion when it had absorbed 0.8% of moisture, K-Gutta in the same time reached equilibrium at 0.3% of water.

It is claimed that K-Gutta has the mechanical and the chemical advantages of gutta percha; while a special advantage in its favor is its ease of manufacture which leaves little or no room for personal error. Modified K-Gutta mixtures in which small quantities of improved rubber (deproteinized and purified rubber) were also added have been and still are under observation but at present the straight mixture of gutta hydrocarbon and petroleum jelly is preferred.

Anti-Dumping Order

The third order under the Abnormal Importations Act, effective as of December 19, 1931, imposes a 50% ad valorem duty on 16 classes of goods including waterproof garments—whether proofed with rubber, oil paint, or other materials, overalls and aprons wholly of rubber, lithopone and rubberized fabrics in the piece.

Imports of lithopone amounted to 69,000 cwt. in November, 1931, double the monthly average in 1930; while imports of rubberized fabrics in the piece in November were 87,000 square yards against a monthly average of 57,000 square yards in 1930.

Manufacturers of rubber footwear are keenly disappointed that the above duty does not apply to plimsolls and the like since it is felt that under present conditions all classes of rubber footwear should be brought within the scope of the Abnormal Importations Orders. Manufacturers, apparently, especially have in mind Japanese footwear imports, which continue heavy; since Japan followed England's example and also went off the gold standard, the drop in the pound is no longer adequate protection for the British rubber footwear manufacturers.

Incidentally, it appears that several firms as Dunlop, Waverley, Greengate & Irwell have reduced prices on plimsolls for the coming season; the reason is not clearly understood. The North British Rubber Co., Ltd., and others have not as yet followed this lead.

Rubber-Sheathed Paving Blocks

The wood paving block with the rubber sheath was first introduced some years ago, but at the time the price of rubber prevented the block from finding favor with road authorities. Present rubber prices, however, have caused the inventor, M. M. Dessau, again to attempt to arouse interest in his block. According to his recent statements in the London *Rubber Age*, a rubber sheath is the only kind of jointing needed to hold a wood paving together. He uses perforated smoked sheet rubber joined at right angles to encase the wood blocks. A rubber-sheathed block, when laid flush with a wood block, grips the latter immovably; the perforations prevent the rubber from rising when the wood swells; and any flow starting after the courses are closed is absorbed in these holes. Thus the level of the surface always remains smooth.

It is calculated that the cost would work out at 5s. 6d. to 6s. a square yard; 15 pounds of raw rubber are required for a square yard of roadway; but this amount could be reduced to as little as 6 pounds if alternate courses of sheathed and plain wood blocks were used. Mr. Dessau proposes to have the blocks sheathed on the site of the roadway to be paved, thus saving the expense of sending the wood to the rubber factory.

Institution of the Rubber Industry

Papers on "Treating Cloth Previous to Rubber Proofing" by J. Y. Stewart, and "Recent Developments in Manufacturing Rubber Sponges" by E. Anderson were read at the Scottish Section meeting of the Institution of the Rubber Industry held in Edinburgh on December 15, 1931.

On January 4 the Manchester and District Section heard B. D. Porritt lecture on the "Value of Organized Research in the Rubber Industry." "A Sales Organization" was dealt with by R. H. Comely at the West of England Section meeting on January 6. The Midland Section on January 7 heard "Production Control in the Rubber Factory," discussed by W. J. Condon. On January 11 at the gathering of the London Section, H. J. Stern and W. Puffet presented a paper on "Testing Antioxidants," while Miss M. Huenemoerder (in collaboration with E. A. Hauser) offered "Some Contributions to the Problem of Fabric Impregnation with Rubber." "Recent Developments in Accelerators" was the topic chosen by Philip Schidrowitz for the Scottish Section meeting on January 20, 1932.

British Notes

Lane Mitchell, Ltd., London, has acquired the business of Hymans, Kraay & Co., rubber broker, 11 Mincing Lane, London, E. C. 3, which in future will be carried on at the same address as Lane Mitchell, Hymans & Kraay, Ltd. N. A. C. Hymans and C. A. Kraay have joined the board of the new company, where Mr. Kraay will act as joint managing director.

The Wilson Rubber Co., Canton, O., U. S. A., will manufacture rubber gloves in Great Britain. F. J. Wilson is in England arranging for the installation of a factory at Slough Estate, Slough.

British Goodrich Rubber Co., Ltd., reported net profits of £73,333 for the year ended September 30, 1931, against £88,124 for 1929-1930. To the former amount is to be added £16,938 brought forward and £11,905 withdrawn from income tax reserve, making a total of £102,176 available for distribution. The dividend on common shares was 5 per cent, the same as the year before; £20,000 were added to general reserve, and £25,000 to contingencies reserve against £15,000 and £10,000 respectively; £17,644 were carried forward.

A low pressure giant tire for commercial vehicles, thought to be the largest tire in the world for road use, has been produced at Ft. Dunlop. The tire is 51 inches in diameter and 15¾ inches wide; the load capacity is 4 tons 14 cwt. a tire, or 9 tons 8 cwt. an axle. Two of these tires would weigh almost as much as a 7 h.p. baby car. Considering the huge loads the tire has to carry, the inflation pressure of approximately 100 pounds per sq. in. is very low.

The I. T. S. Rubber Co., Ltd., Petersfield, Hants, has changed its name to Itshide, Ltd., because Itshide products now form the bulk of the company's business. Besides there are I. T. S. companies in the United States and Canada; so it might appear that the British company was foreign or Dominion owned.

The Swass Suspension Co., Ltd., Newcastle-on-Tyne, has evolved an all-British suspension layout which affords independent springing for each wheel and the replacement of leaf springs by rubber disks.

ITALY

The Societa Italiana Industrie Gomma e Hutchinson, Milan, reporting net profits of 2,700,000 lire for the year ended September 30, 1931, against 2,720,000 lire for the preceding fiscal year, declared a 15 per cent dividend. It was proposed to reduce the capital from 14,000,000 to 10,500,000 lire.

EUROPEAN NOTES

Spain

Figures covering Spain's imports during the first half of 1931 show a slight increase for crude rubber from 1,445 to 1,450 tons, but a sharp decline for all rubber manufactures. Hose and packing were 56 instead of 121 tons; unvulcanized rubber sheet reenforced with cotton for making cord tires, mostly from Italy, were 136 instead of 163 tons; inner tubes fell markedly, from 304 to 63 tons, and treads from 2,735 to 875 tons; heels and soles were only 31 instead of 109 tons; and old rubber, the most important item, as regards quantity, dropped from 6,720 to 3,678 tons.

Exports of rubber manufacturers are insignificant, but it may be noted that shipments of heels and soles from Spain, chiefly to Spanish possessions, rose from 9 to 114 tons.

Russia

The Krasnyl Resinstschik recently opened in Kiev as the first rubber goods factory in the Ukraine, to produce technical rubber goods, waterproof fabrics, and other articles, has a productive capacity of 10,000,000 rubles a year and will employ 1,500 workers.

France

Societe Industrielle des Telephones closes its business year ended June 30, 1931, with a profit of 15,288,141 francs. A dividend of 40 francs a share was turned out; 4,000,000 francs have been reserved for depreciation; while 374,405 francs have been carried forward.

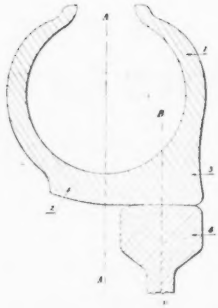
Etablissements Bergougnan reports profits of 17,413,360 francs for the year ended September 30, 1931, against 20,084,012 francs for the year before. 1,756,669 francs have been written off; a dividend of 55 francs per old share against 60 francs, and of 36.25 francs per new share against 41.25, was declared, leaving 6,844,012 francs to be carried forward.

Tire for Railway Vehicles

News mention has for some time past been made of the introduction in France of pneumatic tired railway cars of a new type designed for providing more acceptable transportation at lower costs. This service has required a change in the tread of the tire to meet the conditions encountered in traveling around curves. In such cases when the flange of one of the wheels comes in contact with the rail on one side, the flange of the wheel on the opposite side is about 1½ inches distant from the rail. Thus a maximum tread surface is always obtained owing to the dissymmetric disposition of the tread.

To provide for this condition a pneumatic tire has been designed having a cross section of the form indicated in the accompanying illustration wherein the tread is extended toward the outside to cover the head of the rail. Thus the tire has a larger tread surface which permits it to adapt itself to variations in the distance between the rails on curves.

The relative distance of this adjustment is indicated by the interval between the central vertical axis of the tire section A-A, and the vertical axis B-B of the steel rail.



Michelin Pneumatic Rail-Tire

GERMANY

Tire Protector

Unusually good results have been obtained in experiments carried out in Berlin with a special tire protector that can not only be used to prevent skidding but also to cover the spare tire. The protector has a vulcanized tread built like a regular tire and is supplied with 4 rows of small suction cups which theoretically exert a vacuum of 36 kilos per tire. Under this profiled tread is a double, rubberized layer of cords diagonally crossed. Strong cross fabric side pieces are attached to the tread, and open double rings of endless steel wire are sewed in the hem of the side pieces. At the open end of the wire the fabric side pieces are slit close to the tread and made to overlap. A special closure on the wires permits rapid mounting and demounting of the cover, which can also be drawn on snugly and locked securely.

Tire Dealer Rebates

Last month mention was made of negotiations between manufacturers and dealers regarding tire sales terms. It has now definitely been agreed to fix the rebate to dealers at 14 per cent and the annual bonus from 2 to 5 per cent, depending upon the amount of sales. Manufacturers are to supply only regular tire dealers, recognized manufacturers of automobiles and other vehicles, and large consumers. Before this agreement tire manufacturers not only dealt directly with small consumers but offered the most tempting terms to dealers who in their turn cut prices so that in the final analysis manufacturers suffered loss without the actual consumer benefiting.

Plastic Designs

In a recently patented method of making plastic designs on rubber a mixing of equal quantities of factice and dissolved natural rubber, colored as desired, is applied to the unvulcanized surface of the article. After drying for about one hour at 75°, the surface is again coated with liquid rubber solution and then vulcanized. While drying, the solution-factice mixing shrinks and finally breaks up into irregular patches which are separated by depressions caused by the breaking, thus forming a plastic imitation of crackle-ware design. Rubber articles of all sorts of compounds may be thus treated; the crackled effect is used all over or for bands, figures, etc.

The Idometer

When controlling the thickness of rubber applied to fabric is desired, weighing is not very useful since the specific gravity of rubber and fabric is practically the same. Nor does measuring the thickness of the coated fabric give accurate results, for the thickness may vary. To overcome the difficulty the Idometer, a new measuring instrument has been devised, in which use has been made of the fact that the dielectric constant of rubber considerably exceeds that of the fabric.

The Idometer consists of a condenser through which the rubberized fabric is passed; and as the thickness of the rubber coating varies, the capacity of the condenser changes. These deviations are registered by a recording instrument. It is claimed that the great sensitivity of the Idometer permits the recording of weight variations up to ¼%.

Rubber Thread Cartel

Gummi-Zeitung learns that the International Rubber Thread Assn., founded in May, 1931, in Cologne, to which the rubber thread manufacturers of all countries, including America, belong is functioning to the complete satisfaction of the members. Prices have shown an improvement. At a recent meeting it was decided effective January 1, 1932, to cancel all agreements made before the formation of the association and then put the Cartel agreement into full force.

German Notes

The I. G. Farbenindustrie has put on the market a cellulose sponge, "Agfa Viscose Sponge." Structurally it is a combination of natural and rubber sponges. It resembles the finest natural sponges in their capacity for retaining water; but at the same time, when soaked in water after drying, it swells to a greater extent than do natural sponges and, of course, very much more than rubber sponges.

The Vulkan Gummiwaren-Fabrik Weiss & Baessler A. G., Leipzig, declared a 10 per cent dividend at its last general meeting. As is not unnatural under present economic conditions, business has fallen off; so in certain departments the 4- and 5-day week has been introduced. But no general cessation of work has been necessary anywhere.

The Gummi-Werke Fulda A. G., Fulda, some time ago approached its creditors to close the factory. However, after negotiations in Berlin an agreement was reached which enables the firm to carry on again.

The Deutsche Dunlop A. G., Hanau a. Main, had been considering closing the local factory. But after the Hanau management asked the English parent firm to maintain the factory at its former capacity and after negotiations concerning wages, it decided to continue operations.

Rubber Industry in Far East

MALAYA

More Consumption

Mr. Graburn, a recognized rubber authority and the nominee of the Rubber Growers' Association on the board of the Rubber Research Institute, in an article inspired by Mr. Gallagher's "Challenge to Producers," mentioned recently in these columns, follows what appears to be a different tack, but which in the end tends toward the same direction as that pointed out in the 2 preceding instances. He supports Mr. Gallagher in stressing the need of balanced research, of an organization that would find new uses for rubber, and he states that part of the income subscribed in Malaya for maintaining the Rubber Research Institute must be diverted to the interests of consumption, even at the risk of disorganizing scientific staffs engaged in planting problems. For today research for greater consumption is more vital than continued research for production.

Another writer to the *Straits Times*, in full agreement with Mr. Graburn, points out that the contributions to the Rubber Research Institute are largely concentrated on increasing the yield per acre, and that though half the funds come from holdings under 100 acres, unless something is done to rescue the industry, the end will be that only a few capitalists will be left to benefit by the research work on budding, manuring, etc.

Local Manufacture of Rubber Goods

Of late a remarkable tendency, probably due to the slump in rubber prices, has become noticeable—and that is the desire to save the industry by manufacturing rubber goods locally. Of course there has been previous talk of establishing factories here, but what we notice today amounts to a confident will to achieve. The discussions in lectures and articles or letters to the press have centered chiefly on the problem of finding new means of making money out of Hevea and not merely producing raw rubber to be sold at a loss to manufacturers across the seas. In short, various voices in several ways are calling for independence from the rubber manufacturer abroad.

The *Malayan Tin & Rubber Journal* recently stated that since profits from producing raw rubber have vanished because of the enormous planting activity since 1922, the time has come for Malaya seriously to consider manufacturing rubber goods. To the usual objections to large-scale rubber manufacture in Malaya: namely, unsuitable climate, lack of skilled labor and experts in rubber processing, the reply is as follows:

Since the control and the manufacture of "weather" have been perfected and already extensively used in the United States and England, climate offers no insuperable difficulty. The handicaps regarding labor can be effectually neutralized by adopting the principles of mass production, for experience has proved that any individual of any race, of normal intelligence, can be successfully taught a single operation in a complicated chain of manufacturing processes. Finally the offer of a good salary and terms should enable a prospective manufacturer in Malaya to secure the services of technicians of proved worth.

For the manufacturing site jungle land not too far removed from main roads is recommended as inexpensive; while cheap electric power also is available. The Malayan factory could best operate as a group system in which the constituents are rubber estates supplying the latex and sharing in the profits.

The article winds up optimistically: "Enough has been said to indicate that as far as rubber is concerned, all is not yet lost in Malaya. The pioneer planters did wonderful work. . . . Let the old gang stand aside now to make way for the rubber manufacturing technologist with capital as his servant, not master; then Malaya will yet experience new measures of steady wealth, happiness, and prosperity."

New Rubber Flooring

The *Free Press* learns that the Singapore chemist, Parry Davis, has invented a new process for making rubber flooring characterized by the ease with which it can be applied. Over 200 square yards of flooring at the Masonic Hall, Singapore, have been laid with this new rubber surface. To waterproof its surface the original concrete floor was first "washed" with a thin latex solution treated with anti-coagulant. The latex "wash" dried almost immediately; then a mixture of one part of latex to 2 of a grey powder, to which was added a cold vulcanizer, was prepared and spread like cement, then flooded with the same latex solution that had been used on the bottom. This top coating was vulcanized with a similar, but less concentrated vulcanizer such as used for the cement-like mixture, which gave the surface a highly polished and transparent appearance. The costs average $2 (local currency) a square yard.

Areas Out of Tapping

Nearly 300,000 acres, or 17%, of mature rubber in the Federated Malay States, Johore, Kedah, and the Straits Settlements were out of tapping at the end of September, 1931, an increase of 1% over the preceding month and 3.9 for the year to that date. There were also 125,836 acres, or 7.2%, of the planted area resting in connection with rotational tapping systems.

Hope in Rubber Future

"It is in the manufacture or curing of plantation rubber that our salvation lies," asserted R. O. Bishop, of the Rubber Research Institute of Malaya, in the course of a talk at a dinner of the Singapore Rotary Club.

After touching on costs of tapping, the relative advantages of collecting latex, upkeep, and cultivation, he proceeds to prove his statement in rather an unexpected manner. By improving and elaborating methods of curing, he says, the plantation product can be modified to meet all requirements of European and American rubber manufacturers, and this work is not incompatible with reducing costs, for those factors which effect reduced costs contribute to improved quality of the product. What the penalty is when the rubber grower is unable to meet the needs of the manufacturer, is made clear when it is shown what inroads reclaim has made in the rubber growers' province, for in spite of the low cost of crude rubber the consumption of reclaim continues high, is in fact equal to the output of locally produced first quality raw rubber; and this situation is due to the fact that reclaim fills a definite need of the manufacturer.

If rubber producers could replace reclaim, the market for first quality rubber would be infinitely better than it now is. Considerable advances have already been made in studying the properties of reclaim that make it so acceptable to rubber manufacturers, and encouraging results have been obtained showing that modifications of methods of preparation should enable planters to produce an article with the qualities that have gained for reclaim its importance.

But he would not have producers look only to the rubber manufacturer for an outlet for their rubber, nor concentrate exclusively on finding new uses for rubber. For there are the non-rubber constituents of latex which may be of interest to manufacturers outside the rubber industry, and he already visualizes uses in many and varied industries for some of the known constituents of latex.

Here it must be interpolated that some little while ago another speaker made a similar point, and he added that rubber planting could only be made to pay again when the rubber by-products are exploited.

"The future is full of hope," Mr. Bishop declared toward the end of his talk. "What we have done in the past will be more than surpassed by what we shall do in the future. We in Malaya are going to lead the world in the application of research to plantation industry and the application of efficient control in the exploitation of our raw materials to the utmost advantage."

NETHERLANDS EAST INDIES

Native Rubber

A continuation of the Seventh Native Rubber Report, mentioned in the December issue of INDIA RUBBER WORLD, gives data concerning Tapanoeli, Palembang, and Atjeh for the first half of 1931 and shows that whatever reductions in rubber exports took place during the second quarter of 1931 as compared with the first quarter of that year, they were chiefly caused by the diversion of labor from rubber to collecting rice and to the work of preparing the land for the next rice crop.

While in Palembang, tapping is almost entirely done by the family; in Tapanoeli and Atjeh much tapping is still done by hired help, either local coolies or discharged estate coolies. This drifting of unemployed estate coolies to native holdings is something that will have to be taken into account in estimating native outputs in the near future. Some owners of rubber holdings in Tapanoeli allow coolies as much as ⅔ of the rubber crop collected against ½, the usual arrangement. Here, too, imported Javanese tappers occasionally obtain land from the owners of rubber gardens for the purpose of raising food crops. The coolies in this province make from 22.5 to 30 cents a day; but that they will work for considerably less is proved by the fact that in those sections where tapping is practically at a standstill, they work for 12 to 13 cents (Dutch currency) a day.

There was a very limited amount of new planting, sometimes with selected seed, in Palembang and Tapanoeli. On the other hand, considerable areas of mature rubber were left untapped in all 3 provinces. It is noteworthy that while these temporarily abandoned gardens must be deep in weeds, there was little damage from disease or fire. Although food crops are of first importance, the amount of rubber cut out to make place for rice and so on was slight.

Selling and Manufacturing

"Producers rely too much on statistics from America, the country that knows so well how to create over-production by juggling with figures, and prospers thereby. Rubber manufacturers dominate the producers; their agents, their figures, intended for foreign countries, cause great harm and bring about all the difficulties here."

This is the opinion of J. M. Burgers in a communication to the press in regard to the rubber situation. He then goes on to unfold the following scheme for helping the rubber industry:

Mass production of rubber goods in the East from native rubber.

Central selling of estate rubber and surplus native rubber at prices fixed by the 2 governments and from offices run by a government staff.

Prohibition of export of native rubber by natives.

A safeguard against eventual action by American consumers.

Manufacture, Mr. Burgers suggests, should be carried out at the capitals of the 3 producing centers, that is Singapore, Batavia, and Colombo. These factories should have a capacity sufficient to absorb most of the native rubber produced. Costs of establishment equipment, etc., of the factories would be met by a 5% loan in which all estates under Dutch and British management would have to participate on a *pro rata* basis, and shares would not be negotiable.

The factories would use the rubber produced by the natives in Malaya, Netherlands East Indies, and Ceylon because it is too difficult to control this rubber and also to help the natives retain their source of income since they would be forbidden to export their product. The factories would concentrate on a few articles that easily lend themselves to mass production, as flooring, footwear, and soles.

The rubber produced by British and Dutch growers in the 3 centers named would be sold from 3 central offices in the same towns as the factories. Prices would be jointly fixed by the 2 governments and would be 60 cents per kg. for first quality sheet and crepe, 50 cents for second grades, and 40 cents for the surplus native rubber bought by the estate owners. These offices would be run by a staff appointed and paid by the 2 governments, making them independent of the producers.

In order to counteract any tendency on the part of American consumers to use their old stocks to enable them to keep off the market until they actually needed rubber again, the prices mentioned above would hold only for a year; that at the end of the first year the prices would be changed to 70, 60, and 50 cents, respectively, and at the end of the second year prices would be fixed at 100, 90 and 70 cents per kg. (Dutch currency).

Factory Costs

Finishing rubber to suit the market instead of the manufacturers is costing the rubber grower too much money, and there is a growing insistence that something be done about it. Kuneman in the *Bergcultures*, gives some helpful details regarding methods of handling the rubber with the least cost to the grower; but for their successful application, the cooperation of the market is needed.

To begin with he would eliminate making crepe altogether as the cost of the machinery and the upkeep are too great. Inferior grades, as far as they are in a liquid state, should be worked into sheet. The lowest grades at present hardly pay to ship, but the earth scrap could be dried and smoked before being compressed into cases, when it would keep very well. Lump could be cut into small pieces, dried, and packed in bags, or, better still, buried in a hole in the ground. As for first quality sheet, that is in a class by itself. For the preparation of this grade, Kuneman would abolish machinery run by motive power and substitute hand mangles.

But then the entire routine of production would have to be adjusted to hand operations. Thus tapping tasks should not be too large, permitting the latex to be taken quickly to the factory in the morning and immediately prepared so that mangling could take place in the afternoon before the coagulum got too tough. The coagulum would be quickly run through the mangle by well-trained and properly paid labor, when the sheets would not require much more time than when milled mechanically. With an efficient drying house the sheets can be dried in 5 days.

The entire process as decribed above, from the latex to the packed case, would cost one cent (Dutch currency) per kg., of course, not including chemicals and cases. Where costs frequently average 5 cents, the savings are indeed worth-while. Kuneman insists that with regard to preparing rubber the watchword should be, "Simple and cheap, but dry and clean."

Reclaim Versus Crude

So long have growers of plantation rubber assumed the superiority of their product and regarded crude's humbler relative, reclaim, with more or less disdain that it pains them deeply to find that not only is the sphere of usefulness of the latter steadily widening, but that the price of the better grades of regenerated rubber is actually higher than that of the better grades of the raw material. Not even the great collapse in the price of plantation rubber served either substantially to extend its use or to limit the favor shown for alternatives. Hence an inquiry by the Ceylon Rubber Research Scheme to find out what may be amiss.

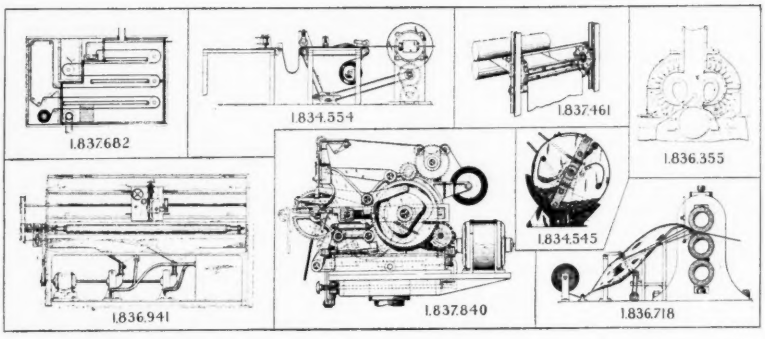
One of the first conclusions is that the amount of reclaim used in the United States is relatively larger than might appear from statistics. In other words, that as only ½ of the world's rubber is prepared under carefully controlled conditions on large estates, it may be taken for granted that in America nearly as much reclaim is used as first class plantation rubber.

Another observation is, "There is no doubt that had there been no reclaim, the raw rubber market would be on a larger scale than it is today."

Obviously, but that does not solve the problem.

Addressing itself to the latter, the Ceylon organization suggests that competition may be relieved by making crude rubber as plastic and elastic and as easily manipulated as reclaim. It must be made softer. Experiments show that crêpe from boiled coagulum requires 20% less mastication than crêpe from unboiled coagulum, but boiling dry rubber has but slight effect on plasticity. So, too, while vulcanization is ordinarily quickened with reclaim, it is slowed nearly 10% by first boiling the raw rubber used therewith. It is also claimed that the boiled rubber will absorb about 20% less moisture than unboiled, hence should be favored for insulation. On the other hand, boiling has the disadvantage of lessening the amount of fatty acid and the deficiency must be supplied with stearic or the like in many mixes. Meanwhile reclaim holds its own, and the raw rubber researchers are still seeking a way to checkmate the usurper.

Patents, Trade Marks, Designs



Machinery

United States

1,834,545.* **Washer Classifier.** This apparatus is designed for selecting heel washers to be used in apparatus for mounting them upon the supporting pins of rubber heel molds. For this purpose the washers must be substantially perfect in form to pass in orderly procession down feeding chutes to the mold pins. W. D. Kmentt, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,834,554.* **Channel Strip Machine.** It is adapted to receive from a tubing machine a rubber covered thin strip of metal and to fold it into channel form. The latter is of such shape as to grip the glass of an automobile window along the outer margins of the legs of the channel. Local binding of the glass is avoided because the pressure of the resilient channel strip is uniform. J. I. Taylor, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,836,355.* **Mixing Machine.** A modification of the ordinary Banbury mixer construction provides a separable wall for the rotor trough which cooperates with the rotor so that a new wall member may be substituted for the old when the latter has become worn. The substitution of a new working surface practically restores the machine to its original efficiency at an expense much less than the cost of a new machine. F. H. Banbury, assignor to Farrel-Birmingham Co., Inc., both of Ansonia, Conn.

1,836,718.* **Stockinet Slitter.** A tubular guide form broad and flat is at the end over which the tubular stockinet is received from a stock roll. The form expands beyond into cylindrical form, then opens out as a flat guide leading the split stockinet into the calender for rubber coating. The splitting of the tubular stockinet takes place by a rotary cutter as the material passes upward over the form to the calender. C. W. Leguillon, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

* Pictured in group illustration.

1,836,941.* **Roller Sanding Machine.** This invention relates to a machine for rough grinding, finish grinding, and sanding any size of rubber rollers such as are used in the printing industry. The machine, self-contained, motor driven, and fully enclosed, is equipped with dust recovering devices. When adjusted to the operation desired, it is automatic until that operation is completed. G. C. Spicer, Cleveland, O.

1,837,461.* **Sheet Material Marker.** Means are provided for imprinting on both sides of calendered cord fabric markings to designate the different grades of rubberized stock. This work is done by the pressure of rollers, which displace the rubber coating while it is in warm condition, producing a definite pattern to a depth sufficient to make a mark without completely penetrating the rubber coating. C. E. Maynard, Northampton, assignor to Fisk Rubber Co., Chicopee Falls, both in Mass.

1,837,682.* **Fabric Coating Apparatus.** In this apparatus fabric in long lengths can be coated on both sides with rubber by passing it in step-like manner in parallel paths from the top to the bottom in a closed chamber. Special heating means are mounted within the chamber through which the web of fabric passes. The process is one of saturation and drying. R. B. Searight, Fulda, Germany.

1,837,840.* **Wrapping Machine.** This machine is adapted to wrap a strand of material to an article, especially for wrapping rubberized tape upon a tire bead core of the wound type to anchor the ends of the winding to the body of the tire bead core. Provision is also made for wrapping the bead without carrying a supply spool of the tape or stranding material about the article being wrapped. F. Slusher, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,832,856. **Vulcanizer.** J. W. Brundage, assignor, by mesne assignments, to National Rubber Machinery Co., both of Akron, O.

1,833,009. **Vulcanizing Apparatus.** J. Wahl, Rosedale, assignor to A. Schrader's Son, Inc., Brooklyn, both in N. Y.

1,833,024. **Rubber Article Form.** A. W. Keen, New York, N. Y., assignor to Morgan & Wright, Detroit, Mich.

1,833,194. **Repair Plug Inserting Tool.** E. O. Young, Euclid Heights, O., assignor, by mesne assignments, to Kex Co., Inc., St. Louis, Mo.

1,833,530. **Tire Making Device.** M. H. Pade, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,834,078. **Inflatable Toy Making Device.** J. Stein, Brooklyn, N. Y.

1,834,325. **Band Builder.** J. W. White, assignor to Seiberling Rubber Co., both of Barberton, O.

1,834,555. **Knife.** H. W. Tittle, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,834,559. **Tire Building Apparatus.** H. E. Waner, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,834,560. **Tire Building Tool.** N. L. Warner, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,834,573. **Calendering Apparatus.** C. C. Cadden, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,834,759. **Printing Plate Making Device.** J. C. Baker, Nutley, assignor to Wallace & Tiernan Products, Inc., Belleville, both in N. J.

1,834,899. **Tire Retread Vulcanizer.** L. O. Grange, Chicago, Ill.

1,834,961. **Winding Machine.** J. V. Moore and C. Jenisch, assignors to Moore Fabric Co., Pawtucket, R. I.

1,835,079. **Sole Cementing Machine.** P. Opacity, Newark, assignor to J. Gitz, Jr., W. Orange, both in N. J.

1,835,296. **Repair Vulcanizer.** L. O. Grange, assignor to W. J. Jarratt, both of Chicago, Ill.

1,835,669. **Tire Shaping Apparatus.** W. L. Pipes, Elizabeth, N. J., assignor to Morgan & Wright, Detroit, Mich.

1,835,986. **Tire Building Form.** A. L. Heston, Columbiana, assignor, by mesne assignments, to National Rubber Machinery Co., Akron, both in O.

1,836,621. **Strength Testing Device.** F. Schubert, Vienna, Austria.

1,836,752. **Plastic Material Mold.** J. O. Goodwin, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,836,850. **Retread Vulcanizer.** C. B. Hudson, assignor to Akron Standard Mold Co., both of Akron, O.

1,836,997. **Hollow Article Core.** G. W. Trobridge, Sutton Coldfield, assignor to Dunlop Rubber Co., Ltd., Birmingham, both in England.

1,837,350 and 1,837,351. **Tire Builder.** G. F. Wikle, Milwaukee, Wis., assignor to Fisk Rubber Co., Chicopee Falls, Mass.

1,837,356. **Repair Vulcanizer.** C. W. Cartier, Chicopee, assignor to Fisk Rubber Co., Chicopee Falls, both in Mass.

1,837,397. **Recorder Controller.** F. J. Bast, Queens Village, assignor to Charles J. Tagliabue Mfg. Co., Brooklyn, both in N. Y.

1,837,405. **Tool.** F. R. Buchanan, White Marsh, Pa.

1,838,057. **Stitcher Disk.** R. E. Jenkinson, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

Dominion of Canada

317,594. **Sectional Tire Retreading Mold.** H. Taylor, Bondi, N. S. W., Australia.
317,850. **Draping Machine.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of E. H. Clark, Reading, Mass., U. S. A.
318,069. **Tire Making Machine.** Goodyear Tire & Rubber Co., assignee of J. S. Ward, both of Akron, O., U. S. A.
318,070. **Cord Fabric Apparatus.** Goodyear Tire & Rubber Co., assignee of W. W. Stephens, both of Akron, O., U. S. A.
318,071 and 318,072. **Collapsible Chuck.** Goodyear Tire & Rubber Co., assignee of E. G. Templeton, both of Akron, O., U. S. A.
318,073. **Forcing and Drawing Tool.** Goodyear Tire & Rubber Co., assignee of J. W. Goodall, both of Akron, O., U. S. A.

United Kingdom

355,817. **Tennis Shoe Lasting Machine.** British United Shoe Machinery Co., Ltd., Leicester. (United Shoe Machinery Corp., Boston, Mass., U. S. A.)
356,758. **Extruding Gutta Percha on Cables.** Western Electric Co., Ltd., London. (B. M. A. Trebes, Oak Park, Ill., U. S. A.)
356,849. **Floor Covering Apparatus.** Dunlop Rubber Co., Ltd., London, and F. W. Warren, Manchester.
356,966. **Vulcanizing Mold Heater.** Hungarian Rubber Goods Factory, Ltd., P. Klein, and S. Gotléb, all of Budapest, Hungary.
356,996. **Golf Ball Cleaner.** C. W. Strong, Portland, Ore., U. S. A.
357,601. **Mechanical Press.** L. Mellersh-Jackson, London. (A. Terkelsen, Newton, Mass., U. S. A.)

Germany

539,671. **Tire Mounting and Demounting Tool.** A. Boesen, Kasted per Mundelstrup, Denmark. Represented by C. Boldt, Flensburg.
540,048. **Vulcanizer.** Naamlooze Vennootschap Vereenigde Nederlandsche Rubberfabrieken, Heveadorp, Holland. Represented by G. Winterfeld, Berlin S. W. 68.
540,384. **Vulcanizer.** National Rubber Machinery Co., Akron, O., U. S. A. Represented by J. Fritze, Hamburg, and C. Stoepel, Berlin S. W. 11.
540,581. **Tire Valve.** F. Xaver, Stadler Munich.
540,585. **Tube for Inflating Hollow Bodies.** S. Saul, Aachen.

Designs

1,196,800. **Heel-Attaching Device.** E. Zimmermann, Wuppertal-Barmen.
1,197,052. **Attaching Soles to Shoes.** H. Heitzer, Dremmen, Bez. Aachen.
1,197,121. **Insert for Pulley.** F. Clouth, Rheinische Gummiwarenfabrik A. G., Koln-Nippes.

Process

United States

1,833,415. **Elastic Housing.** J. M. Crawford, assignor to General Motors Corp., both of Detroit, Mich.
1,834,108. **Shoe.** R. Rice, Johnson City, N. Y., assignor to United Shoe Machinery Corp., Paterson, N. J.
1,834,363. **Paper Manufacture.** J. H. Watson and H. E. Anderson, both of Linwood, Scotland.
1,834,582. **Shoe.** R. T. Griffiths, Akron, O., assignor, by mesne assignments, to Miller Rubber Co., Inc., Wilmington, Del.
1,835,415. **Tube.** W. C. Martin, Chicago, assignor to J. H. Lee, Oak Park, both in Ill.
1,836,057. **Casing.** A. O. Abbott, Jr., assignor to Morgan & Wright, both of Detroit, Mich.
1,836,692. **Forming Hollow Articles.** D. F. Twiss and E. A. Murphy, both of Birmingham, England, assignors to Dunlop Rubber Co., Ltd.

Dominion of Canada

317,640. **Pile Fabric.** Collins & Aikman Corp., Philadelphia, assignee of A. W. Drobile, Cynwyd, both in Pa., U. S. A.
318,067. **Tire.** Goodyear Tire & Rubber Co., assignee of A. J. Musselman, both of Akron, O., U. S. A.
318,096 and 318,097. **Abrasive Article.** Norton Co., assignee of D. E. Webster, both of Worcester, Mass., U. S. A.
318,143. **Article from Aqueous Dispersion.** Dunlop Rubber Co., Ltd., London, N. W. 1, England, and Anode Rubber Co., Ltd., St. Peter's Port, Guernsey, Channel Islands, assignees of E. W. Madge, Birmingham, England.
318,144. **Article from Aqueous Dispersion.** Dunlop Rubber Co., Ltd., London, N. W. 1, England, and Anode Rubber Co., Ltd., St. Peter's Port, Guernsey, Channel Islands, assignee of E. A. Murphy, A. Niven, and D. F. Twiss, co-inventors, all of Birmingham, England.

United Kingdom

354,787. **Boot Manufacture.** United Shoe Machinery Corp., Boston, assignee of G. Goddu, Winchester, both in Mass., U. S. A.
355,014. **Heel Protector.** J. Jasus and A. J. Anderson, both of Danville, Ill., U. S. A.
355,332. **Connecting Uppers to Insoles.** United Shoe Machinery Corp., Boston, assignee of G. Goddu, Winchester, both in Mass., U. S. A.
356,058. **Crepe Sole.** J. O. Farrer, London. (E. A. J. Willems, Java, Dutch East Indies.)
356,203. **Rubber Destructive Distillation.** H. Arias, Paris, France.
356,276. **Molding Footwear.** H. C. L. Dunker, Helsingborg, Sweden.
356,519. **Devulcanizing Rubber.** Rubber Regenerating Co., assignee of A. W. Bull, both of Naugatuck, Conn., U. S. A.
356,670. **Connecting Uppers to Soles.** F. Nadherny, Vienna, Austria.
357,158. **Molding Hollow Toys.** Radium-Gummiwerke, Cologne, Germany.
357,494. **Connecting Uppers to Insoles.** Chaulux Soc. Anon. Pour La Fabrication De Chaussures De Luxe, Hal, Belgium.
357,682. **Artificial Dentures.** H. D. Morgan, Youngstown, O., U. S. A.

Germany

540,718. **Masks.** Dragerwerk Heinr. & Bernh. Drager, Lubeck.
540,719. **Tubes.** K. Bratring, Antwerp-Berchem, Belgium. Represented by F. Quade, Berlin-Zehlendorf.
540,722. **Combs.** Gebr. Kleinmann, Berlin-Lichtenberg.

Chemical

United States

1,832,964. **Rubber Protection.** C. E. Bradley and C. D. Mason, assignors to Mishawaka Rubber & Woolen Mfg. Co., all of Mishawaka, Ind.
1,833,021. **Age Resister.** L. H. Howland, Passaic, N. J., assignor to Naugatuck Chemical Co., Naugatuck, Conn.
1,833,287. **Transferring Composition.** F. K. Hadley, assignor to St. Louis Rubber Cement Co., both of St. Louis, Mo.
1,833,941. **Factice.** D. Falls, Belfast, Ireland, assignor of ½ to F. W. Haines, Detroit, Mich.
1,835,050. **Age Resister.** L. H. Howland, Passaic, N. J., assignor to Naugatuck Chemical Co., Naugatuck, Conn.
1,835,998. **Petroleum Oil Treatment.** J. T. Giron, Mexico, Mexico.
1,836,660. **Rubberized Article.** H. R. Haertel, Wrentham, assignor to T. H. Dumper, trustee, Newton, both in Mass.
1,836,702. **Antioxidant.** L. J. Christmann, Jersey City, N. J., assignor to American Cyanamid Co., New York, N. Y.
1,836,940. **Age Resister.** R. L. Sibley, Nitro, W. Va., assignor to Rubber Service Laboratories Co., Akron, O.
1,837,877 and 1,837,878. **Core Paste.** J. F. McDowall, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.
1,838,034. **Age Resister.** S. M. Cadwell, Leonia, and S. I. Strickhouser, Passaic, both in N. J., assignors to Naugatuck Chemical Co., Naugatuck, Conn.
1,838,058. **Antioxidant.** W. M. Lauter, assignor to Goodyear Tire & Rubber Co., both of Akron, O.
1,838,062. **Accelerator.** J. Teppema, Akron, O.

Dominion of Canada

317,340. **Electrical Insulation.** W. S. Smith, Newton Poppleford, H. J. Garnett, Sevenoaks, and J. N. Dean, Orpington, co-inventors, all in Eng.
317,469. **Antioxidant.** Rubber Service Laboratories Co., Akron, O., assignee of S. M. Evans, Nitro, W. Va., both in the U. S. A.
317,470. **Accelerator.** Rubber Service Laboratories Co., Akron, O., assignee of R. L. Sibley, Nitro, W. Va., both in the U. S. A.
317,714. **Insulation Compound.** Western Electric Co., Inc., New York, N. Y., assignee of A. R. Kemp, Westwood, and J. H. Ingmanson, Bloomfield, co-inventors, both in N. J., all in the U. S. A.
317,727. **Reclaimed Rubber.** C. H. Campbell, Pittsburgh, Pa., assignee of Peter Cooper Corp., Wilmington, Del., assignee of American Glue Co., Boston, Mass., assignee of C. H. Campbell, all in the U. S. A.
318,064. **Non-Adhesive Liner.** Goodyear Tire & Rubber Co., assignee of W. D. Wolfe, both of Akron, O., U. S. A.

318,065. **Rubber Compounding.** Goodyear Tire & Rubber Co., assignee of L. B. Sebrell, both of Akron, O., U. S. A.
318,066. **Antioxidant.** Goodyear Tire & Rubber Co., assignee of A. M. Clifford, both of Akron, O., U. S. A.
318,075. **Rubber and Fabric Reclaiming.** Hercules Powder Co., Wilmington, Del., assignee of L. T. Smith, Kenvil, N. J., both in the U. S. A.
318,076. **Vulcanizable Thermoplastic Products.** Imperial Chemical Industries, Ltd., London, S. W. 1, assignee of H. M. Bunbury, Manchester, both in England.

United Kingdom

356,731. **Rubber Composition.** J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfort a. M., Germany.)
356,769. **Rubber Cement.** Bakelite Corp., New York, N. Y., assignee of R. P. Courtney, Maplewood, N. J., both in the U. S. A.
356,818. **Tire Composition.** H. Wade, London. (Bakelite Corp., New York, N. Y., U. S. A.)
356,923. **Age Resister.** Imperial Chemical Industries, Ltd., London.
356,933. **Antioxidant.** Goodyear Tire & Rubber Co., Akron, O., U. S. A.
357,488. **Synthetic Rubber.** I. G. Farbenindustrie A. G., Frankfort a. M., Germany.
357,760. **Accelerator.** Goodyear Tire & Rubber Co., Akron, O., U. S. A.

Germany

539,740. **Softener for Resins.** Selden Co., Pittsburgh, Pa., U. S. A. Represented by K. Michaelis, Berlin W. 50.
540,101. **Resinous Polymerization Products.** I. G. Farbenindustrie A. G., Frankfurt a. M.
540,102. **Vulcanizing Rubber.** I. G. Farbenindustrie A. G., Frankfurt a. M.
540,223. **Hardening Polymerization Products of Diolefines.** I. G. Farbenindustrie A. G., Frankfurt a. M.
540,224. **Polymerization Products of Butadiene Hydrocarbons.** I. G. Farbenindustrie A. G., Frankfurt a. M.
540,361. **Products with Resin and Wax Properties.** I. G. Farbenindustrie A. G., Frankfurt a. M.
540,489. **Electrophoretic Rubber Deposits.** Anode Rubber Co., Ltd., London, England. Represented by W. Karsten and C. Wiegand.
540,631. **Vulcanizing Natural and Synthetic Rubber.** Metallgesellschaft A. G., Frankfurt a. M.
540,944. **Vulcanization Process.** E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., U. S. A. Represented by F. Meffert and L. Sell, both of Berlin S. W. 68.

General

United States

1,833,019. **Airplane Tire.** J. A. Faucher, Detroit, Mich., and E. P. Halliburton, Tulsa, Okla., assignors to Morgan & Wright, a corporation of Mich.
1,833,052. **Vehicle Endless Track.** A. F. Masury, assignor to International Motor Co., both of New York, N. Y.
1,833,225. **Tire.** C. Neimeyer and W. A. Brubaker, both of Akron, assignors to H. F. Freeman, Lakewood, all in O.
1,833,478. **Inflatable Hollow Body.** L. E. Williams, London, and G. E. James, Bath, both in England.
1,833,502. **Freezing Liquid Corer.** H. E. Strunk, Ontario, Calif., assignor, by mesne assignments, to Popsicle Service, Inc., Chicago, Ill.
1,833,531. **Ball and Driver.** H. C. Pearson, Pasadena, Calif.
1,833,534. **Golf Bag Club Segregator.** J. G. Remfrey, Minneapolis, Minn.
1,833,606. **Shoe.** G. H. Gillis, Fitchburg, Mass.
1,833,697. **Swimming Belt.** A. Walrus, Brooklyn, N. Y.
1,833,718. **Railway Vehicle Tire.** A. J. Michelin, Paris, assignor to Michelin et Cie, Clermont-Ferrand, both in France.
1,833,905. **Self Locking Adjustable Boot.** C. W. King, Memphis, Tenn., assignor to J. E. Kissmer and M. P. King.
1,834,160. **Water Bottle Electric Heater.** W. K. Kise, Kansas City, Mo., assignor to G. C. Hardin, Ft. Smith, Ark.
1,834,376. **Insulated Wire.** H. Böving, assignor to Western Electric Co., Inc., both of New York, N. Y.
1,834,427. **Airplane Landing Gear.** C. B. Schumacher, Pittsburgh, Pa.
1,834,551. **Overshoe.** R. E. Riley, Akron, O., assignor, by mesne assignments, to Miller Rubber Co., Inc., Wilmington, Del.
1,834,606. **Heat Resistant Belting.** C. C. Davis, Belmont, assignor to Boston Woven Hose & Rubber Co., Cambridge, both in Mass.
1,834,748. **Shoe Heel.** O. Teodorini, assignor of ¼ to B. S. Speck, both of New York, N. Y.

Dominion of Canada

317,343. **Imitation Leather Fabric.** R. and J. Pickles, co-inventors, both of Lancaster, England.
317,396. **Hot Water Bag.** C. G. Taylor, Arrowood, Alberta.
317,449 and 317,450. **Form Fitting Boot.** Mishawaka Rubber & Woolen Mfg. Co., assignee of G. L. Van Dinter and C. Ferrettie, co-inventors, all of Mishawaka, Ind., U. S. A.
317,457. **Vehicle Flooring.** Ohio Rubber Co., Cleveland, assignee of B. Bronson, Lakewood, both in O., U. S. A.
317,512 and 317,513. **Upright Highway Marker.** M. E. Hartzler, Downers Grove, and E. P. Romilly, Chicago, co-inventors, both in Ill., U. S. A.
317,750. **Shampoo Drain.** L. V. Cannady, Denver, Colo., U. S. A.
317,791. **Dental Polisher.** H. R. Priest, Loudonville, O., U. S. A.

United Kingdom

354,436. **Shoe Upper.** Greengate & Irwell Rubber Co., Ltd., S. Frankenburg, and J. Ridings, all of Manchester.
355,137. **Drinking Vessel.** Industria Astur Soc. Anon. and M. Mata, both of Gijon, Oviedo, Spain.
355,620. **Heel.** I. J. Marcelle, Toronto, Canada.
355,894. **Road Marking Block.** H. J. Haynes, Portsmouth.
355,964. **Window Glazing Channel.** A. E. Dutfield, London.
356,054. **Wheel and Tire.** L. Albareda, Barcelona, Spain.
356,065. **Tire.** Goodyear Tire & Rubber Co., Akron, O., U. S. A.
356,070. **Horseshoe.** Etablissements Chanoux, Albisson & Cie, Vaucluse, France.
356,178. **Air Cushion.** New York Rubber Corp., New York, N. Y., U. S. A.
356,358. **Bathing Cap Handbag.** Dunlop Rubber Co., Ltd., London, and C. Hemm, Manchester.
356,625. **Footwear Stud.** H. Norman, Buckinghamshire.
356,884. **Bicycle Tire.** E. Reichstein, Brandenburg-on-Havel, Germany.
356,890. **Golf Practising Ball.** T. H. Hart, Birmingham.
356,891. **Seat.** H. A. Lamplugh and Lamplugh Spring Seats, Ltd., both of London.
356,897. **Air Cushion.** R. W. Sampson, New York, N. Y., U. S. A.
356,939. **Vehicle Mudguard.** A. Riley, Coventry.
357,000. **Pneumatic Toy.** Dr. Dorogi Es Tarsa Gummigyar R. T., and I. and L. Dorogi, all of Budapest, Hungary.
357,045. **Catamenial Appliance.** I. F. Brisache, New York, N. Y., U. S. A.
357,129. **Overshoe.** Mishawaka Rubber & Woolen Mfg. Co., Mishawaka, Ind., U. S. A.
357,212. **Floor Covering.** Dunlop Rubber Co., Ltd., London, and H. C. Young, Manchester.
357,391. **Ventilating Footwear.** M. Jepsen, Varde, Denmark.
357,426. **Footwear Lace.** C. Marx, Berlin, Germany.

Germany

539,636. **Shaving Brush.** J. Lang, Frankfurt a. M.

Designs

1,194,715. **Closure for Hot Water Bottles, Etc.** A. G. Metzeler & Co., Munich.
1,194,718. **Sole and Heel.** Continental Gummiwerke A. G., Hannover.
1,194,745. **Bicycle with Balloon Tire.** Gebr. Reichstein Brennabor-Werke, Brandenburg a. d. H.
1,195,256. **Rubber-soled Sandal.** Chemnitzer Filzschuh & Pantoffel-Fabrik Max Harlass, Chemnitz.
1,195,409. **Hose Rack.** M. Baumgartner, Riesa i. Sa.
1,195,686. **Non-Skid Buffer for Stands.** Blodner & Vierschrodt, Gummiwarenfabrik & Hanfschlauchweberei A. G., Gotha.
1,195,940. **Mat.** W. Kubler, Brackenheim.
1,196,302. **Rubber-covered Frame for Carpet-Sweepers.** E. C. Muller, Cologne.
1,196,526. **Conveyor Edge Protectors.** Continental Gummiwerke A. G., Hannover.
1,196,581. **Belt.** Ungarischer Gummiwarenfabriks A. G., Budapest, Hungary. Represented by J. Reitstotter, Berlin-Friedenau.
1,196,585. **Stamp.** C. Hagedorn, Jr., Hamburg.
1,196,630. **Corset.** E. Ulmann, Korntal i. Wurtt.
1,196,651. **Ice Bag.** W. Bischoff, Lahr i. B.
1,196,753. **Sling.** Margarete Steiff G. m. b. H., Giengen a. d. Brenz.
1,196,777. **Non-Skid Ferrule for Crutches, Etc.** Orthopadische Industrie G. m. b. H., Konigsee i. Thur.
1,196,933. **Tray.** W. Knoefel & Co., Komm.-Ges., Weimar-Grosskronsdorf.
1,196,997. **Weather Stripping.** A. Levin, Berlin-Britz.

1,197,069. **Sole.** H. Heitzer, Dremmen, Bez. Aachen.
1,197,213. **Tubing.** B. Heidemuller, Berlin O. 112.
1,197,315. **Stocking.** Firma Franz Anton, Zeulenroda i. Thur.
1,197,317. **Mattress.** Munden-Hildesheimer Gummiwaarenfabriken A. G., Gebr. Wetzell, Hildesheim.
1,197,731. **Dental Rubber.** W. C. Hoffmann, Koln-Kalk.
1,197,858. **Handle.** Ungarische Gummiwarenfabriks A. G., Budapest, Hungary. Represented by J. Reitstotter, Berlin-Steglitz.
1,197,982. **Mouthpiece.** L. Mundigl, Regensburg.
1,198,100. **Dental Rubber.** A. Banzhof, Berlin-Spandau.
1,198,133. **Tread.** Firma Georg Schwanz, Chemnitz.
1,198,154. **Sponge.** Continental Gummiwerke A. G., Hannover.

Trade Marks

United States

288,682. Words: **"Charmode, Combination Last, Fashion Arch,"** with the letter "V" running through them. Footwear. Hahn Department Stores, Inc., Wilmington, Del.
288,702. Representation of a tire containing the word: **"Atlas"** and other markings. Atlas Supply Co., New York, N. Y.
288,713. Representation of a heel. Heels. United Shoe Machinery Corp., Boston, Mass.
288,714. **Courdaye.** Footwear. Melville Shoe Corp., New York, N. Y.
288,715. Representation of a pennant containing the word: **"Sturdeze."** Footwear. Fein & Glass, Inc., Reading, Pa.
288,717. **Safe-Way.** Footwear. C. H. Daniels, Boston, Mass.
288,719. **Sand-Piper Sandal.** Footwear. Essex Rubber Co., Inc., Trenton, N. J.
288,720. **Cem-Pro.** Footwear. Endicott Johnson Corp., Endicott, N. Y.
288,728. Fanciful design containing the representation of a girl and the words: **"Ida May."** Footwear. Ebner Shoe Co., Milwaukee, Wis.
288,729. **Lucky 'Three.'** Footwear. Woodbury Shoe Mfg. Co., Derry, N. H.
288,730. Representation of a foot below a streamer containing the words: **"Mold-Rite."** Footwear. Kresge Department Store Corp., Newark, N. J.
288,797. **DirectCure.** Electrical vulcanizing equipment. W. J. Jarratt, Chicago, Ill.
288,864. **Fifth Avenue.** Cushion. Kleistone Rubber Co., Inc., Warren, R. I.
288,982. **Valesse.** Vaginal douches. United States Rubber Co., New York, N. Y.
289,045. Representation of the heads of a boy and a girl, and the words: **"Joan & Tim Thrift."** Footwear, etc. A. H. Gueting Co., Philadelphia, Pa.
289,078. Circle containing the words: **"Zimate—R. T. Vanderbilt Co. N. Y. American Products."** Accelerator. R. T. Vanderbilt Co., Inc., New York, N. Y.
289,105. **"Personalized Tally-Ho."** Golf balls. U. S. Golf Ball Corp., Chicago, Ill.
289,131. **Tweedettes.** Footwear. Tweedie Footwear Corp., Jefferson City, Mo.
289,160. **GoodShot!** Balls. H. C. Lee & Co., Inc., New York, N. Y.
289,166. **Niagara.** Hose. United States Rubber Co., New York, N. Y.
289,178. **Reddy Patch.** Repair kits. Lee Rubber & Tire Corp., Conshohocken, Pa.
289,243. **Suberit.** Hockey balls, play balls, etc. Suberit-Fabrik A. G., Mannheim-Rheinau, Germany.
289,255. **Drilastic.** Saddles. Flexible Saddles, Ltd., Tyseley, England.
289,400. Rectangle broken by the letter: **"V,"** and containing the words: **"The Veil Shoe."** Footwear. C. H. Daniels, Boston, Mass.
289,401. **Free Walking.** Footwear. Woodbury Shoe Mfg. Co., Derry, N. H.
289,417. Design formed by varied lines and repetitions of the words: **"Oak Krome Resist Wear."** Footwear. Endicott Johnson Corp., Endicott, N. Y.
289,429. **Prolite.** Golf accessories including balls. Prolite, Cleveland, O.
289,481. **Altax.** Accelerators. Goodyear Tire & Rubber Co., Akron, O.
289,497. **Suprex.** Pigments and fillers. J. M. Huber, Inc., New York, N. Y.
289,554. Along the edges of the material, a color band comprising 3 stripes: white, green, and white. Patches and patch material for rubber goods. R. M. Hollingshead Co., Camden, N. J.
289,642. **Vigorous.** Footwear. Gallenkamp Stores Co., San Francisco, Calif.
289,754. **Jar-Less.** Heels. Jarman Shoe Co., Nashville, Tenn.
289,764. **Kitty Kelly.** Footwear. Stern & Kellner, assignor to Kitty Kelly Shoe Corp., both of New York, N. Y.
289,810. Signature: **"O'Sullivan's"** above a representation of a rubber heel containing the words: **"O'Sullivan's Safety Cushion Heel."** Heels. O'Sullivan Rubber Co., Inc., New York, N. Y.
289,825. **Blissful.** Footwear. Dodge, Bliss & Perry Co., Inc., Newburyport, Mass.
289,826. Representation of a sole of a foot containing the word: **"Form-Older."** Footwear. Chas. W. Strohbeck, Inc., Brooklyn, N. Y.
289,831. **Air Cooler.** Footwear. C. H. Daniels, Boston, Mass.
289,853. **Hy-Tex.** Balloons. Oak Rubber Co., Ravenna, O.
289,888. **Wilshire.** Druggists' sundries. McKesson & Robbins, Inc., Bridgeport, Conn.
289,900. **Bobbler.** Toys. United States Rubber Co., New York, N. Y.
289,922. Representation of a crown and the words: **"Royal Satin."** Prophylactic rubber goods. Miller Drug Sundry Co., Baltimore, Md.
289,938. **Bonita.** Gloves, aprons, etc. S. H. Kress & Co., New York, N. Y.
289,940. **Sunshine.** Nipples. Pyramid Rubber Co., Ravenna, O.
290,030. **Hepteen.** Accelerator. Naugatuck Chemical Co., New York, N. Y.
290,078. **Eastman.** Rubber solution and retouching fluid. Eastman Kodak Co., Rochester, N. Y.
290,154. **Rain-Breaker.** Raincoats and waterproof suits. M. Reingold, doing business as Rubber-All Co., New York, N. Y.
290,244. **Dri-Kleen.** Thread. Chatham Mfg. Co., Portland, Conn.
290,251. Word: **"Mastercraft"** between 2 fancy arrow heads. Paint brushes. Rubber & Celluloid Products Co., Newark, N. J.

Prints

United States

13,455. **Latex Pro-Medica.** Rubber goods. Comet Envelope & Printing Co., New York, N. Y.

Labels

United States

39,547. **Best By A Long Stretch. Elastic.** Southern Webbing Mills, Inc., Greensboro, N. C.
39,548. **Armored Rubber Threads. Elastic.** Southern Webbing Mills, Inc., Greensboro, N. C.

Designs

United States

85,567. **Shoe.** Term 7 years. P. E. Young, Fairhaven, Mass.
85,580. **Tire.** Term 3½ years. E. H. Gorsuch and F. F. Slack, assignors to Corduroy Tire Co., all of Grand Rapids, Mich.
85,623. **Tire.** Term 14 years. L. E. Sexton, Oak Park, assignor to Sears, Roebuck & Co., Chicago, both in Ill.
85,700 and 85,701. **Sole.** Term 3½ years. W. E. Kavenagh, assignor to Goodyear Tire & Rubber Co., both of Akron, O.
85,747. **Hot Water Bottle.** Term 14 years. T. H. Gray, Ft. Worth, Tex.
85,805. **Water Bottle.** Term 14 years. H. A. Bell, Providence, R. I., assignor to Goodyear's India Rubber Glove Mfg. Co., Naugatuck, Conn.

BELGIUM

Members of the Chambre Arbitrale et de Conciliation pour le Caoutchouc, Antwerp, having decided to reorganize the futures market for plantation rubber, which it may be remembered existed and prospered greatly before the war, resumed operating on January 4, 1932. Business is transacted through the Banque Union Financiere d'Anvers, S. A. (B. U. F. A.) (capitalized at 100,000,000 francs,) which guarantees all registered contracts. The contract unit is fixed at 3,000 kilos standard smoked sheet, and quotations are in Belgian francs.

Shiraishi Kogyo Kaisha, Ltd., with main office at Kuwana, Mie-Ken, and branch offices at Jikatahashiba, Minami-senju, Tokio, and 1014 Nishientecho, Naniwaku, Osaka, all in Japan, reports an annual business of over 50,000,000 pounds as manufacturer of light and heavy calcium carbonate and the colloidal whiting, Hakuenka, besides acting as exporter and importer of industrial chemicals, etc. The company has 2 factories, one at Tatsuta-Mura, Mie-Ken, and the other at Shimonita, Gunma-Ken. K. Honjo is manager of the Osaka branch.

Rubber Market Review

1931

New York Exchange

THE most disappointing factor in the rubber market during 1931, and the one which was fundamentally responsible for the downward course of prices, was the persistently high rate of production.

Imports for the year into the United States alone totaled 495,163 tons, against 488,343 tons in 1930. Although this is little more than one per cent higher than the previous year, it doesn't tell half the story.

Going back to November and December of 1930, we find that production in those 2 months was over 45,000 tons on an average. Allowance was made for this production figure because it was said that November and December were the two heaviest months in the year. After the turn of the year, it was said, the low price of rubber would force natives to stop production. But it didn't. Month after month production was maintained at high levels.

Month after month traders declared, "This can't last. Those producers can't make money at these prices, and it is only a question of time before the weak companies will be forced to the wall."

The fallacy of this reasoning was soon apparent. Instead of curtailing output, the lower prices served to increase output! It was found that the natives, who depended on the sale of rubber for the money with which to buy their daily supplies, increased production to preserve their buying power. In other words, when rubber was at 10 cents they would tap a stated amount of rubber to provide for their needs over a period of time. With rubber at 5 cents they had to produce twice as much rubber to secure the same amount of money. So the heavy tapping figures went on, culminating in December, 1931, with importations into the United States of 51,931 tons, the heaviest for any previous month since April, 1929.

With importations at such a heavy rate, consumption fell even lower than it was in 1930. For 1931 consumption was 348,986 tons, against 375,980 tons in 1930, a decline of about 7 per cent. The most bearish feature of all, however, was the way stocks on hand accumulated.

At the end of the year, U. S. stocks on hand amounted to 322,826 tons, against 200,998 tons at the end of 1930, or an increase of 60.6 per cent! The size of these figures led traders in Britain to declare that American manufacturers were taking advantage of the situation at the expense of British shareholders in plantation companies. Because rubber was being accumulated here at prices said to be under cost and manufacturers were "protecting themselves in a time of plenty against a time of scarcity which they know must come sooner or later," it was said that "British shareholders are subsidizing American buyers to the extent of at least £3,000,000 this year."

Perhaps rubber at 5 cents is being bought under cost. A few years ago rubber at 15 cents would have been sold below cost, too. But costs of production have come down as drastically as the sale price of rubber. Many traders believe that rubber can be produced at 6 cents, and the Rubber Division of the Department of Commerce reported several cases where the cost was said to be under this figure and as low as 4 cents.

Prices of crude rubber on the New York Exchange showed a downward trend. From a high of 8.50 cents in January, an all-time low of 4.10 cents in the old "A" contract was reached early in December. At the close of the year the price was about 4¾ cents.

The market rallied several times during the year, not because the statistical position showed any real improvement but because restriction efforts led to the belief that the heavy production rate was to be cut down by artificial means. There were 3 periods in which restriction news held the interest of the market, the last one of which extended into the new year.

The beginning of March witnessed the first of these rumors. The British and Dutch were getting together, was the report, and would produce a cooperative plan. But on March 25 the announcement came that restriction efforts had been abandoned because the large growers were not in favor of the plan.

As a result of this first effort 2 opinions arose in the market; they continued to prevail during all the rest of the rumors. One was that restriction was the only method by which the rubber industry could be lifted out of the disastrous condition into which overproduction had plunged it. The other was that if natural forces were allowed to take their course, the industry would perhaps suffer more, temporarily, but in the end would find itself in a stronger position than ever before. On receipt of the notice that this first effort had come to naught, the market dropped to 7 cents, the year's low.

In May the question again became prominent, with the British and the Dutch meeting together but not agreeing about a reduction plan. In August these negotiations were definitely declared off, and the market slumped to another new low of 5 cents.

In a weak market prices for the next few months were in the doldrums; the climax was reached when rubber hit 4.10 cents early in December. This extreme price again spurred the restrictionists, and the greatest effort so far was apparently made to get the 2 largest producing countries together to agree on a drastic cut in production as the only salvation of rubber growers.

Proponents of restriction had high hopes when it was announced from sources close to the 2 negotiators that a 45 per cent cut in production was under consideration. The Governor-General of the Dutch, however, seemed to be cool to the idea of government interference in the matter; and since all meetings were held with the greatest secrecy, the issue was still in doubt at the close of the year, with the market drifting in a narrow range, waiting on an official announcement.

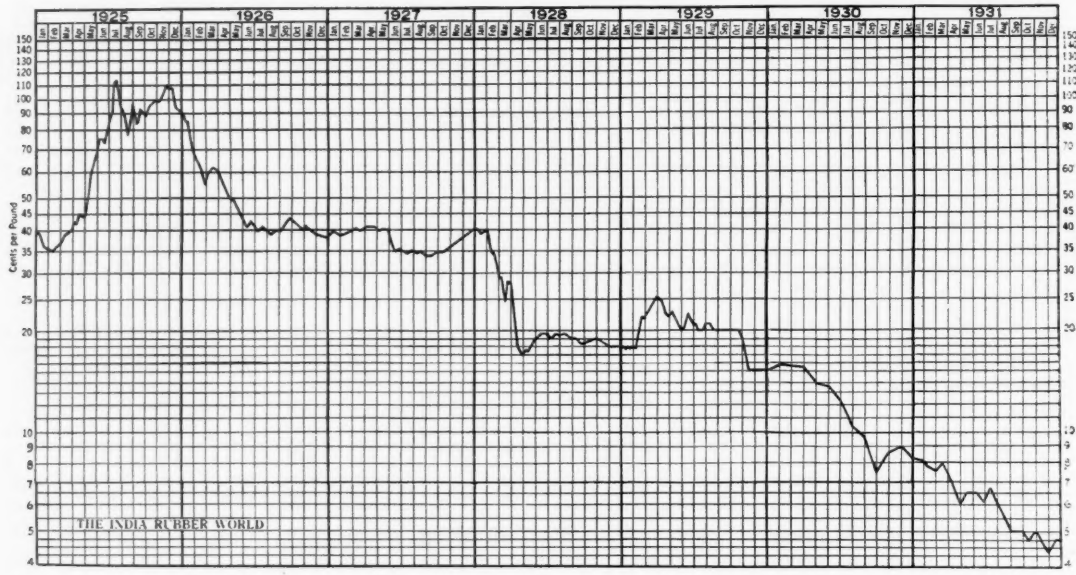
Great things were expected from the automobile and the tire industries during 1931 but these high hopes were quickly dispelled. Sales of automobiles were 1,000,000 below 1930, and tire sales found none of the replacement demand which everyone was sure would materialize. Not only were car owners running tires threadbare, but it seemed that tires were so well constructed that the previous estimates as to the normal life of a tire were far too low.

In February it seemed as though the automobile industry would lead the way to better business. Congress had voted the war

Rubber Exchange Activities

Contracts Sold

	1930				1931					
	"A"		No. 1 Standard		No. 1 Standard		New "A"		Old "A"	
Month	Number	Tons	Number	Tons	Number	Tons	Number	Tons	Number	Tons
Jan.	9,784	24,460 0	....	....	510	5,100	11	110	919	2,297½
Feb.	8,982	22,455.0	....	....	1,102	11,020	24	240	1,403	3,507½
Mar.	5,411	13,527.5	....	....	1,355	13,550	22	220	1,519	3,797½
Apr.	4,786	11,965.0	473	4,730	1 748	17,480	76	760	1,770	4,425
May	2,929	7,322.5	423	4,230	1,441	14,410	22	220	675	1,687½
June	5,531	13,827.5	812	8,120	2,215	22,150	27	270	712	1,780
July	4,232	10,580.0	720	7,200	1,889	18,890	38	380	406	1,015
Aug.	4,132	10,330.0	1,046	10,460	1,601	16,010	11	110	711	1,777½
Sept.	4,980	12,450.0	1,173	11,730	1,641	16,410	23	230	117	292½
Oct.	3,353	8,382.5	1,351	13,510	1,235	12,350	8	80	109	272½
Nov.	2,744	6,860.0	1,049	10,490	2,530	25,300	43	430	119	297½
Dec.	2,714	6,785 0	958	9,580	2,203	22,030	27	270	104	260
Totals	59,578	148,945.0	8,005	80,050	19,479	194,700	332	3,320	8,564	21,410



New York Outside Market—Closing Prices Ribbed Smoked Sheets—1925-1931

veterans a huge cash bonus; the proceeds of which seemed to be spent to a great extent on new motor cars.

The tire industry met conditions in the most logical way possible. It is estimated that tire inventories are substantially lower than for last year and at such a low ebb that better demand would see dealers rushing orders to manufacturers.

Tire prices were cut twice. Regret was expressed at the second cut because manufacturers were not making a great deal, and the second cut was a reduction of income that was hardly necessary in the opinion of many connected with the trade.

In spite of all these factors, the volume of transactions on the Rubber Exchange of New York, Inc., showed a reduction of only 4.1 per cent from the previous year. Transactions in 1931 amounted to 219,430 tons, against 228,995 tons in 1930. Considering that consumption of rubber dropped 7 per cent and that manufacturers slowed down by from 5 to 20 per cent, the activity on the Exchange was gratifying.

The position of the market at the year end was one of expectancy. While not so prone to forecasting as in other years, the hope was still expressed that an improvement might be expected in the automobile industry following the annual automobile shows. Hopes were also held as to a favorable announcement on restriction.

N. Y. Outside Market

An estimate of the volume of business done in the actuals market in 1931 can best be given by figures showing the stocks on hand in the United States at the end of the year.

These stocks totaled 322,826 tons on December 31, a jump of 121,828 tons over the previous year's total of 200,998 tons. Large quantities of cheap rubber, therefore, seem to have been accumulated and stored by buyers in the United States. In spite of the extent of these takings, however, they were consummated at gradually diminishing prices over the entire year.

Ribbed smoked sheets, for instance, were around 8½ cents at the end of 1930, and 4⅞ cents at the end of 1931; No. 1 thin latex was 9 cents against 5⅞; No. 2 amber was 7⅞ against 4¾; No. 1 brown was 7⅞ against 4¾; and upriver fine Para was 11½ cents at the close of 1930, against 5⅞ at the end of 1931.

The large imports had much to do with this condition, as well as the weak consumption. United States imports for 1931 were 495,163 tons against 488,343 in 1930; consumption was 348,986 tons against 375,980; while world consumption and production showed the same trend.

The shrinkage in consumption can be laid at the door of the automobile industry. Car manufacturers use 85 per cent of all the rubber consumed in the United States; so the fact that the business done by automobile makers was the lowest in 10 years has much to do with the showing.

Production of automobiles did not exceed 2,500,000 units in 1931, a decline of about a third from the 1930 total of 3,505,000, and a drop of more than 50 per cent from the record 1929 production of 5,500,000 vehicles. Still gasoline consumption will show a slight gain over 1930; yet car owners are not buying new cars or new tires.

A radical adjustment was undertaken in the tire industry. Tires on hand November 30, the latest date available, show that stocks decreased 4.6 per cent below the previous month, and 17.5 per cent below Nov. 30, 1930.

Undoubtedly there are a great many threadbare tires on the road, and many obsolete models of motor cars. Even though prominent men are cautious about making future predictions, an official of the tire industry remarked that he was more optimistic about the outlook in the tire industry than he had been for the last 5 years.

Coming back again to the history of 1931 in the outside market, we find that restriction news played a repeated part in activities. Declarations and denials about restriction plans see-sawed the market up and down. A third announcement of meetings between the Dutch and the British came at the year end. But even into the first few weeks of the new year no definite announcement as to what transpired was forthcoming from any official source.

It is more than 2 years now that the hope of a workable agreement being produced first influenced the market. While every discussion has given rise to hopes and disappointments and to rises and falls in the market, the ultimate outcome may be that the action is unnecessary.

For during all this time the economic rectifier has been at work. Production figures have astounded traders for a considerable time. The very methods used, however, to defeat all predictions of lessened output will eventually be the ones to turn the tide. Forced tapping of the trees has made it possible for less tappers to produce an amount of rubber equal to that tapped before low prices forced small growers from the picture, but the damage to the trees will become evident sooner or later.

What is looked upon as an indication of this fact is the figure showing U. S. stocks afloat for December. The figure was 53,940 tons, a drop from the November total, 77,443 tons. The December consumption total of 21,409 tons was also a bit better than expected.

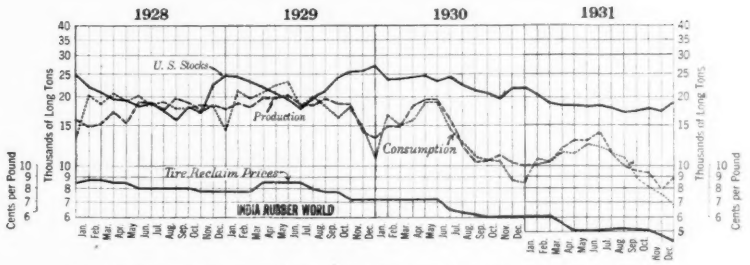
Two cuts in prices of tires during the year, each one of from about 5 to 15 per cent, have dropped quotations to the lowest levels of all time. Mechanical improvements such as free wheeling have made motor cars more desirable, and the only bar to the release of that long-looked-for replacement demand seems to be the reduction of income to which so many have been subject. The needs and desires are present—and will be until the money to satisfy them is also present.

New York Outside Market—Low and High Spot Rubber Prices—1925-1931

Prices in Cents Per Pound

		January	February	March	April	May	June	July	August	September	October	November	December
1925,	First latex crepe	34¼@39½	34¾@39	38½@44½	41¼@46¾	44¾@69½	69@85	78@1.22	71@99	80@96	92@1.03½	99@1.14	89@1.10
	Ribbed smoked sheet	34¼@39½	34½@38¼	38¼@43¾	41¾@46	44¾@70	70@87	81@1.23	64@99	79@95	92@1.02½	98@1.13	88@1.10
	Upriver fine	33@37	31½@33¼	31½@37½	36@37½	37¾@57	52@78	76@1.13½	69@93	68@75	71½@95	89@1.03	79@1.04
1926,	First latex crepe	71@92½	57@70	53½@64	47½@60	47@50½	41½@45	40¼@44½	37@41	40¼@42¾	42¾@43¼	38¾@42	36¾@39
	Ribbed smoked sheet	70@91	55½@69	46½@63	59½@63	47@50½	41½@45	40⅞@44½	37@41	38@40	38@39	32½@38	31@33
	Upriver fine	62@83	48@63	44@59½	41@53½	38@43	34@37	37@41	36¾@39½	38@40	38@39	32½@38	31@33
1927,	First latex crepe	38@41¼	37¼@40⅜	40@42¾	40¾@41¾	41@41¾	35¼@41	34½@35⅝	34¼@36¾	33@34¾	33⅜@35½	35¼@39	39¾@41¾
	Ribbed smoked sheet	37¾@41¼	37¼@40	39½@42¼	40½@41½	40½@41¾	34¾@40½	34¾@35⅝	34@36¾	33@34¾	33@35½	35⅛@41¾	39¾@41½
	Upriver fine	29@34½	27¼@32	32@35	32¼@33	32¼@37	30@37	29½@31	30@30¾	28¾@30	27@28¾	28@30½	30½@35
1928,	First latex crepe	38⅞@41¼	28½@38¼	24¼@29¼	17@29¼	17½@20⅜	19@20	19@20	19¼@20½	18½@19½	19@20¼	18⅝@19¾	18¾@19
	Ribbed smoked sheet	38⅝@41¼	38@41¼	24@29¼	16¾@27½	17½@20¼	19¾@23	18¾@19⅞	18¾@20	19@21	18¼@19½	18⅞@20	17⅝@18⅞
	Upriver fine	29½@33½	24@29	21¾@25⅛	16¾@24	18⅜@21	20@23	21½@23	20½@23	20⅝@21¾	19@21½	19⅛@20	19¼@20
1929,	First latex crepe	18¾@22⅝	22@27¾	22½@26½	20⅝@23¼	21¾@24⅛	22⅝@23⅝	20⅝@23⅛	20⅝@22⅝	19⅝@21¾	19¼@21¾	16½@19⅛	16¼@17⅝
	Ribbed smoked sheet	18¾@23⅛	23¾@26⅞	21¾@26½	19½@23⅝	20@23⅝	20@23⅝	20⅝@23⅝	19⅞@21¾	18¾@20½	18¾@20¾	15½@18⅛	15½@16½
	Upriver fine	19½@23¾	21¾@27¾	23@27	21¾@24⅛	21¾@23⅝	21¾@23⅝	21¾@22½	19¾@21¾	19½@21¾	19½@20½	15¾@19¼	15¾@16½
1930,	Thin latex crepe	15@23¾	15⅝@16½	15⅝@16½	14⅜@15⅞	14⅞@14¾	12¾@14¾	10⅞@12¾	10¼@10⅞	07¾@10¼	07¾@09¾	08¾@09¾	08¾@09¾
	Ribbed smoked sheet	15@16¾	15⅜@16¾	14⅜@15¾	13¾@14¾	13¾@14¾	10⅜@12½	09½@10⅜	09¾@10¾	07½@09¾	07¾@09¾	08¾@09¾	08¾@09¾
	Upriver fine	15¾@16¾	15¾@16¾	15¾@16½	14⅜@15¾	14⅜@15¾	13½@14¾	13½@14¾	13¼@13¾	12¾@13¾	12¾@13¾	12¾@12½	12¾@12½
1931,	Thin latex crepe	15¾@16¾	16¼@17¾	16¾@17¾	15¾@16¾	15¾@16¾	14¾@15¾	13½@14¾	13¼@13¾	12¾@13¾	12¾@13¾	12¾@12½	12¾@12½
	Ribbed smoked sheet	08¾@16¾	07¾@08¾	07¾@08¾	06¾@07¾	06¾@07¾	06¾@07¾	06¾@07¾	05½@06¾	04¾@05¾	04¾@05¾	04¾@05¾	04¾@05¾
	Upriver fine	07¾@08½	07¾@08	06¾@08	06@06¾	06@06¾	06¾@07	05¾@06¾	05¼@05¾	04½@05¼	04½@05	04½@05	04½@05
	Ribbed smoked sheet	Nominal	09¼@	09@09½	08¼@09	08¼@08⅝	08¼@08¾	08¾@08¾	07¼@08¾	06@07¼	06@	05¼@06¼	05½@05¾

Reclaimed Rubber



Production, Consumption, Stocks, and Price of Tire Reclaim

THE halt in reclaiming operations coincident with year-end inventory taking was reflected in the December consumption figure which was 6,812 tons. But even at that, the showing was not bad. The production of reclaimed rubber, on the other hand, increased to 8,876 tons; while stocks jumped to 19,257 tons. The percentage of reclaimed used to crude was 31.8, compared with a revised figure for November of 32.7.

The feeling within the industry is that things are loosening up. There are no extraordinary developments, of course, but there is a quiet air of confidence which is apparent to anyone in touch with the trade.

Jobbers, distributers, and manufacturers believe that a replacement demand for old rubber goods should materialize in the not-far-distant future, and perhaps a further stimulus will be given by artificial methods of restriction.

The President's plan for a $2,000,000,000 finance corporation may be reflected in greater activity in the building field; so many insulated wire factories are marking time until frozen credit starts to thaw and warms up building promotions.

A tour of New England and the Midwest, recently made by a prominent trader, revealed that manufacturers were in fairly good shape. One factory reported that its unit volume for last year had increased 20%. This showing is exceptional, of course, but spotted throughout the territory visited were factories that were humming with activity—the fellows who were rolling up their sleeves and going after business.

Prices remained unchanged except for a ¼-cent drop in No. 2 tubes. Quotations are at bed rock, and no change is expected, unless it be upward. While January figures are not available, it is expected that they will be bullish and that both production and consumption will show a good improvement.

If the spirit of "quiet optimism" discerned by the above-mentioned trader in his tour is productive of results and if the new legislation now being formulated is successful, the market may gradually pull out of its lethargic state.

New York Quotations

January 26, 1932

	Spec. Grav.	Cents
High Tensile		
Super-reclaim, black	1.20	5½/5¾
red	1.20	5¼/5½
Auto Tire		
Black	1.21	4¼/4½
Black selected tires	1.18	4½/4¾
Dark gray	1.35	5 /5¼
White	1.40	5¾/6
Shoe		
Unwashed	1.60	5¼/5½
Washed	1.50	6 /6¼
Tube		
No. 1	1.00	6½
No. 2	1.10	4¾/5
Truck Tire		
Truck tire, heavy gravity	1.55	5¾/5½
Truck tire, light gravity	1.40	5½/5¾
Miscellaneous		
Mechanical blends	1.60	3¼/3½

United States Reclaimed Rubber Statistics—Long Tons

Year	Production	Consumption	Consumption Per Cent to Crude	United States Stocks*	Exports
1925	132,930	137,105	35.6	13,203	4,571
1926	180,582	164,500	45.9	23,218	5,391
1927	189,144	178,471	47.6	24,980	8,540
1928	208,516	223,000	50.4	24,785	9,577
1929	219,057	224,253	47.9	27,464	12,721
1930	157,967	153,497	41.5	24,008	9,468
1931					
January	10,460	11,003	37.6	20,466	649
February	10,871	10,800	37.5	18,878	625
March	12,938	12,524	38.2	18,375	752
April	13,267	11,745	35.2	18,356	577
May	13,478	13,103	34.6	18,088	798
June	14,066	13,045	34.4	18,505	703
July	11,393	11,447	35.8	17,720	414
August	10,110	9,972	36.1	17,165	410
September	9,629	8,932	37.8	17,226	516
October	9,482	8,126	36.4	17,741	671
November	7,892	7,492	32.7	17,662	395
December	8,876	6,812	31.8	19,257	461

*Stocks on hand the last of the month or year.
Compiled by The Rubber Manufacturers Association, Inc.

From ZINC ORE to ZINC OXIDE

Controlled Production With Resultant Higher Standards of Quality and Uniformity

The Rubber Industry's preference for ST. JOE Lead-Free ZINC OXIDE is entirely due to the proved fact that—by virtue of its exceptional quality and uniformity—this product has established definitely higher standards for rubber compounds in which zinc oxide is used.

To a large degree, this achievement has been made possible by one highly important factor: UNITY OF CONTROL IN PRODUCTION, FROM ZINC ORE TO ZINC OXIDE. The St. Joseph Lead Company owns and operates zinc mines at Edwards, N. Y., and ST. JOE ZINC OXIDE is made from ores produced there.

Thus, in every step of production, this Company's control is coordinated to the end of maintaining the higher standards of quality and uniformity for which ST. JOE Lead-Free ZINC OXIDE is recognized in the rubber industry.

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ST. JOE ZINC OXIDE

Market Reviews

Crude Rubber

UNCERTAINTY over restriction news was the principal market factor during January. For the entire month traders awaited official news as to whether or not the 50% restriction scheme said to be under consideration between the Dutch and the British is to be put through.

Present prices are ruinous to the producer of crude rubber, and British opinion has criticized American manufacturers for continuing to take rubber at these low figures when they know that it is being bought at prices below the cost of production.

However this may be, shipments are still heavy. After dropping in December, Malayan shipments for January are again expected to be around 45,000 tons. In December, United States imports alone were 51,931 tons. How long this ruinous rate of production will continue no one knows. With lower freight rates another incentive to increase shipments has been given.

In the automobile and tire industry, on the contrary, production has been cut to meet demand. Output has stepped up somewhat in the last month because of the introduction of new models. The annual automobile show at New York which officially opens the new season was said by exhibitors to have exceeded all expectations both as to sales and attendance. If this showing is substantiated by a real consumer demand, the automobile industry may lead us out of our slough of despond.

Activity in the New York outside market has largely been confined to buying on a scale down, with occasional large sales reported on the dips. Restriction news is also a buying factor in this market.

Manufacturers, however, are understood to be well supplied with rubber. The year end figure of 322,826 tons of rubber on hand is an indication of the quantities of rubber that manufacturers have stored in their warehouses. It has been a buyer's market, and for this reason factory representatives are making their purchases as needed and increasing their stocks at opportune times.

Week ended January 2. Reports and denials regarding restriction caused the widest fluctuation in the rubber market for the week. The 4 days of the week, sandwiched between 2 3-day holidays, showed a fair amount of business, and prices declined from 4 to 13 points from the levels of the previous week.

The restriction rumor had it that a "full and extensively worked out scheme for rubber restriction has been completed." An Amsterdam press dispatch to London said that it had been reliably learned that the scheme provides for restricting production of European-owned plantations of 45% of their 1929 output, with native production in the Dutch East Indies probably reduced proportionately.

RUBBER BEAR POINTS

1. Restriction news is lacking.
2. Malayan shipments in January are expected to be 45,000 tons, against December's total of 35,741 tons.
3. Automobile output in 1931 was only 2,459,563 units, against 3,508,829 in 1930.
4. December production on estates under 100 acres in the Far East was 18,588 tons, against 17,327 tons during November; on estates over 100 acres it was 21,249 tons, against 21,105 tons in November.
5. Dealers' stocks in the Far East were 27,024 tons in December, against 20,865 tons in November; estate supplies dropped only slightly.
6. Tire sales for 1931 are estimated at about 50,000,000 units, against 54,000,000 in 1930, a 4% decrease.
7. Dealers' stocks in Malaya were 50,721 tons at the end of December, against 41,372 at the end of November and 39,610 at December 31, 1930.
8. Lower freight rates from the Far East will probably influence greater shipments.
9. Heavy December imports of 51,931 tons brought United States stocks on hand to 322,826 tons at December 31, 1931.
10. Arrivals of rubber at American ports during 1931 were 495,163 tons, against consumption of only 348,986 tons.

RUBBER BULL POINTS

1. Rubber, according to John L. Julian, president of the Rubber Exchange of New York, is selling at a price below cost of production.
2. Sales and attendance at the automobile show in New York were encouraging.
3. Crude rubber afloat for the United States during December was 53,940 tons, against 77,443 tons at the end of November, and 56,035 tons at December 31, 1930.
4. Tire shipments in November increased 1.3% over October, 1931, and 1.9% over November, 1930; production decreased 15.9% under October.
5. Tires on hand November 30, 1931, were 4.6% under October 31 and 17.5% under November 30, 1930.

Unfortunately a cable quoting a Dutch government official emphatically denied that a scheme had been settled upon. "Any statement concerning restriction would upset the tranquility which is so desirable in the interests of the market," was the opinion of the Dutch Colonial Office.

Because of the secrecy surrounding the purported meetings between the Dutch and the British rumors like the above are almost certain to upset the market. The wish is father to the thought in many cases, and traders who are in favor of restriction leap at any indication that negotiations have been successful. Those in the other camp act similarly.

But even those traders who would rather not see artificial schemes enacted to control rubber production admit that a successful plan would raise rubber prices. Each month that passes aggravates conditions in the Far East and sends so many more weak producers to the wall. A restriction plan would save these marginal producers, but the question is are they worth saving? The weeding-out process is painful but will make for healthy growth in the end. The only fallacy to this argument is that large companies as well as small ones are being pinched.

November sales of automobiles were 68,867 vehicles, compared with 80,142 in October, and 136,754 in November, 1930. The Census Bureau announced that manufacturers' sales of automobiles during November were the lowest of any month for which they have records, and their files were started in July, 1921.

Automobile production during December has increased at more than the usual seasonal rate, but output is still low. For the week ended December 26, according to *Cram's Automotive Reports*, actual output was 14,772 cars, against 13,629 in the preceding week, and 20,748 in the same week last year. Tire sales for 1931 are figured at about 4% less than in 1930; while replacement sales are estimated to be about the same as the 38,000,000 casings sold in 1930.

Prices at the close of January 2 on No. 1 Standard contract were:

Position	High	Low	Close		Previous Close
Jan.	4.80	4.68	4.78	4.80	4.79
Feb.	...	...	4.81		4.92
Mar.	4.98	4.85	4.85	4.92	5.05/5.07
Apr.	...	...	4.92		5.10
May	5.10	5.05	5.00	5.03	5.16
June	...	...	5.05		5.21
July	5.21	5.10	5.10	5.12	5.27/5.28
Aug.	...	...	5.15		5.34
Sept.	...	...	5.25		5.42
Oct.	...	...	5.35		5.52
Nov.	...	...	5.45		5.62
Spot	...	...	4.80		4.81

In the outside market the 4 holidays in 2 weeks made for a quiet market. Prices were bid up to some extent on the report of a 45% restriction scheme, but on the denial of the report the market again settled back. Prices at the close of January 2 were:

Spot	Jan. 2	Month Ago	Year Ago
Crepe	5¼	4 11/16	8½
Ribs	4⅛	4 7/16	8¼
Upriver fine	5¾	5¾	...

Week ended January 9. A break on Monday that carried prices down from 33 to 38 points followed the announcement of the Malayan shipment figures. Although they were smaller than last month, they were said to be higher than the trade expected. Lack of definite restriction news also lent an easier tone to the market.

This loss, however, was largely eradicated in the trading for the rest of the week so that the week's closing prices were only about 10 points down. January closed at 4.68 cents compared with 4.78 cents last week; March was 4.76 cents against 4.85 cents; July, 5.01 cents against 5.10 cents; and October, 5.25 cents against 5.35 cents.

December exports from Malaya were 35,751 tons, compared with 48,012 tons in November, and 41,889 tons in December, 1930. Ceylon exports were 6,891 tons, against 4,853 in November, and 6,932 in December, 1930. Of the Ceylon total, 4,866 tons were destined for United States ports, compared with 3,424 tons in November and 3,902 tons during December a year

previous. Malayan shipments to the United States totaled 17,754 tons in December, against 36,049 tons during November, the smallest total for 1931, according to the New York Rubber Exchange. The total December shipments from Malaya were the smallest since October, 1928, or just prior to the removal of the Stevenson restrictions. Rubber exports to all other consuming countries last month, however, including the United Kingdom, British possessions, the Continent, and Japan, were increased over those for December.

Automobile output for the week ended January 2 was 18,890 cars and trucks, according to *Cram's Automotive Reports*, against 14,772 cars and trucks for the preceding week and 20,656 for the same week last year. New passenger car registrations indicate that less than the usual seasonal decline would be shown for November.

The increase in automobile production coincides with the opening of the New York automobile show, January 9 to 16.

A restriction rumor that rallied prices for a time said that the Governor General of the Dutch East Indies had cabled his approval of the British-Dutch rubber restriction plan to the Department of Colonies at the Hague. The advices, however, stated that no official confirmation of this report could be obtained.

Traders are patiently waiting for official news on the negotiations under way between the British and the Dutch, and until such confirmation is received, the market will probably respond to the many reports, all of which are said to be "reliable."

Prices at the close of January 9 on No. 1 Standard contract were:

Position	High	Low	Close	Previous Close
Jan.	4.75	4.75	4.68	4.72
Feb.	...	...	4.72	4.76
Mar.	4.85	4.85	4.76/4.78	4.80
Apr.	...	...	4.82	4.86
May	4.96	4.96	4.88/4.90	4.92
June	...	...	4.94	4.99
July	5.10	5.01	5.01/5.02	5.06
Aug.	...	...	5.08	5.12
Sept.	5.15	5.15	5.15	5.18
Oct.	5.30	5.25	5.25	5.28 Asked
Nov.	...	...	5.33	5.36
Dec.	...	...	5.41	5.44
Spot	...	...	4.69	4.73

The outside market was extremely quiet during the week except for Monday. The sharp break brought buyers into the market and a good volume of business was done. For the rest of the week, buyers were in to some extent, but they did not buy rubber on any noticeable scale. These buyers are carefully watching restriction cables; and if a scheme goes through, they will probably rush into the market. Prices at the close of January 9 were:

Spot	Jan. 9	Month Ago	Year Ago
Crepe	5	4 11/16	8 3/4
Ribs	4 11/16	4 7/8	8 1/2
Upriver fine	5 3/16	5 1/2	...

Week ended January 16. On Monday sales in crude rubber futures totaled 90 tons, and on Tuesday only 60 tons. This trading contrasted with a total volume of 1,210 tons on Friday when the market weakened on receipt of the December report of the Rubber Manufacturers' Association. The weekly prices, however, were only off a few points.

January contracts closed at 4.61 cents against 4.68 cents for last week; March was 4.70 cents against 4.76 cents; May, 4.81 cents against 4.88 cents; July, 4.93 cents against 5.01 cents; and October, 5.15 cents against 5.25 cents.

December imports, at 51,931 long tons, were the highest for any one month since April, 1929. Consumption was only 21,409 tons, making a discrepancy between the two figures of 30,522 tons, which was reflected in the on-hand figures.

Domestic stocks of crude rubber on December 31 were placed at 322,826 tons, an increase of 10.4% over the total in November, and 60.6% over December 31, 1930. Crude rubber afloat to the United States dropped to 53,940 tons, against the 77,443 tons afloat to this country at the end of November, and 56,035 tons at the end of December, 1930. These figures reflected the low exports from Malaya, which were the smallest in 3 years.

The year's consumption was 348,986 tons, against 375,980 tons during 1930, and 466,475 tons during 1929.

Dealers' stocks in Malaya at the end of December totaled 50,721 tons, compared with 41,372 tons at the close of November and 39,610 tons on December 31, 1930.

Freight rates from Singapore were cut last week. The new price, $8.50 a ton, is a drop of $3 from the former rate of $11.50 a ton and is effective for 6 months beginning January 1, 1932.

The R. M. A. also announced that shipments of tires in November increased 1.9% over November, 1930, and 1.3% compared with October, when the normal decrease between October and November is 26.3%. Production decreased 15.9% under October and 5.8% under November, 1930. Tires on hand November 30 dropped 4.6% under October 31 and 17.5% under November 30, 1930.

Both attendance and sales at the New York automobile show showed gains over last year and led dealers to hail the beginning of revival. S. A. Miles, the show manager, stated that attendance was better than last year's by a third, and "both in actual sales and in negotiations entered into for trade-ins, last year's exposition was surpassed considerably."

Production of cars by manufacturers was stepped up considerably, and one of the largest low-price manufacturers started producing a new model.

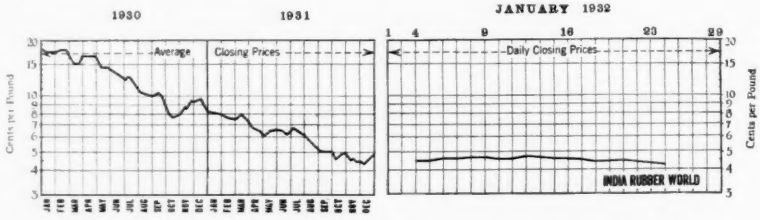
Prices at the close of January 16 on No. 1 Standard contract were:

Position	High	Low	Close	Previous Close
Jan.	...	...	4.61	4.59/4.60
Feb.	...	...	4.65	4.62
Mar.	4.70	4.68	4.70	4.66/4.70
Apr.	...	...	4.75	4.73
May	...	...	4.81	4.80
June	...	...	4.87	4.86
July	4.91	4.91	4.93	4.92/4.93
Aug.	...	...	4.99	4.99
Sept.	5.06	5.04	5.06	5.06
Oct.	5.14	5.13	5.15	5.15
Nov.	...	...	5.25	5.25
Dec.	...	...	5.35	5.35
Spot	...	...	4.61	4.61

In the outside market out-of-town manufacturers bought little rubber, and only low bids could dispose of Far Eastern c. i. f. rubber. There was a report, however, of one large transaction in the market. The year-end statistics were disappointing, and the large stocks of rubber on hand in the United States indicate that manufacturers are well covered in their requirements. Prices at the close of January 16 were:

Spot	Jan. 16	Month Ago	Year Ago
Crepe	5 1/16	4 13/16	8 5/8
Ribs	4 5/8	4 7/16	8 1/4
Upriver fine	5 1/2	5 1/2	...

Week ended January 23. In a heavy market, prices on the Exchange lost a little over ¼-cent for the week. Activity at primary centers was sluggish; dealers sold out rubber, disappointed at the course of events; and unfavorable estimates as to Malayan shipments. All these factors weakened the market.



New York Outside Market—Spot Closing Prices Ribbed Smoked Sheets

New York Outside Market—Spot Closing Rubber Prices—Cents Per Pound

	January, 1932																			
	1*	2*	4	5	6	7	8	9	11	12	13	14	15	16	18	19	20	21	22	23
Ribbed Smoked Sheet	...	...	4 7/16	4 7/16	4 9/16	4 9/16	4 11/16	4 11/16	4 5/8	4 5/8	4 3/4	4 11/16	4 5/8	4 5/8	4 1/2	4 3/8	4 3/8	4 3/8	4 5/16	4 1/4
No. 1 Thin Latex Crepe	...	...	4 3/4	4 3/4	4 7/8	4 11/16	5	5	4 11/16	5	5 1/16	5 1/16	5 1/16	5 1/16	4 11/16	4 7/8	4 7/8	4 7/8	4 11/16	4 3/4
No. 1 Thick Latex Crepe	...	...	4 3/4	4 3/4	5	5	5 1/4	5 1/16	5 1/16	5 1/4	5 1/4	5 1/16	5 1/16	5 1/16	5	4 11/16	4 11/16	4 11/16	4 7/8	4 11/16
No. 1 Brown Crepe	...	...	4 1/4	4 1/4	4 3/16	4 1/4	4 1/2	4 1/2	4 3/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16
No. 2 Brown Crepe	...	...	4	4	4 1/16	4	4	4	4	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4
No. 2 Amber	...	...	4 1/4	4 1/4	4 3/16	4 1/4	4 1/2	4 1/2	4 3/16	4 1/16	4 1/16	4	4	4	4	4	4	4	4 1/16	4 1/16
No. 3 Amber	...	...	4 1/16	4 1/16	4 1/4	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/4	4 1/4	4 1/2	4 1/16	4 1/16	4 1/16	4 1/16	4
No. 4 Amber	...	...	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/16	4 1/4	4 1/4	4 1/4	4 1/4	4 1/4	4 1/4	4	4	4	3 15/16	3 15/16
Rolled Brown	...	...	4	3 15/16	3 15/16	3 15/16	4 1/16	4 1/16	3 15/16	4	4	4	4	4	3 7/8	3 3/4	3 3/4	3 3/4	3 15/16	3 3/4

*Holiday.

The decline can also be ascribed to the lack of news regarding restriction. Not a word has come from abroad as to the progress of negotiations between the Dutch and the British; and since many traders believe that agreement is necessary to save the market from going to pieces, it is only natural that the long silence is interpreted pessimistically.

The January position dropped to 4.34 cents on Tuesday and to 4.29 cents on January 22. Closing prices on Friday saw March at 4.40 cents against 4.61 cents at the close of the previous week; May at 4.49 cents against 4.70 cents; July at 4.63 cents against 4.93 cents; October at 4.83 cents against 5.15 cents; and December at 5.03 cents against 5.35 cents. Closing prices on Saturday were about 3 points down from Friday's close.

A cable to the Rubber Exchange said that exports of crude rubber by Malaya, which dropped to the low total of 35,741 tons during December, will show a material increase during January to around 45,000 tons. For the first half of January shipments were about 19,000 tons. It was believed that a large amount of rubber was withheld during December awaiting the lower freight rates announced this month.

Production on estates under 100 acres in size in British Malaya for December was 18,588 tons against 17,327 tons during November, while the output of estates larger than 100 acres amounted to 21,249 tons against 21,105 tons in November. Dealers' stocks increased from 20,865 tons in November to 27,024 tons in December; while supplies on estates fell from 21,800 tons to 20,083 tons.

Automobile manufacturers showed a slight change for the better in production figures for the last week although the gain was less than seasonal.

Prices at the close of January 23 on No. 1 Standard contract were:

Position	High	Low	Close	Previous Close
Jan.	...	...	4.24	4.29
Feb.	...	...	4.28	4.33
Mar.	4.40	4.33	4.33	4.38/4.40
Apr.	...	...	4.38	4.43
May	4.48	4.43	4.43	4.49
June	...	...	4.50	4.55
July	4.62	4.56	4.57	4.62/4.64
Aug.	...	...	4.63	4.68
Sept.	4.71	4.70	4.69/4.72	4.74/4.76
Oct.	...	...	4.78	4.83
Nov.	...	...	4.87	4.93
Dec.	5.03	4.95	4.97	5.03
Spot	...	...	4.26	4.31

The actuals market held up better in price than the Exchange market. C. i. f. shipments were said to have been offered at too high a price for acceptance; so the outside market did not share the decline in the Exchange market.

Buying for usual requirements was all that was done by manufacturers' agents. Traders report some business on a scale down, but not much. The market is marking time until definite restriction news is received. Closing prices on January 23 were:

Spot	Jan. 23	Month Ago	Year Ago
Crepe	4¾	5⅛	8⅜
Ribs	4½	4⅝	8⅛
Upriver fine	5½	5½	...

On January 25, actuals were offered at 4¼ cents for spot ribs, but this price developed no buying movement on the part of factory interests.

On January 26 the market was steady. Spot ribs closed nominal at 4.22 cents, February at 4.33 bid and 4.35 asked.

New York Quotations

Following are New York outside market rubber quotations in cents per pound for one year ago, one month ago, and Jan. 26.

Plantations	Jan. 26, 1931	Dec. 26, 1931	Jan. 26, 1932
Rubber latex....*gal.*	75	69	69
Sheet			
Ribbed, smoked, spot	8¼	4⅞/4 13/16	4¼
Jan.-Mar.	8¼/8⅜	5	4 15/16
Apr.-June	8½/8⅝	5⅛/5¼	4½/4 7/16
July-Sept.	8⅞/9	.....	4 7/16/4¾
CREPE			
No. 1 Thin latex, spot	8⅝/8¾	5⅜/5 7/16	4¾
Jan.-Mar.	8⅜/8⅞	5⅛/5½	4⅛
Apr.-June	8⅞/9	5½/5⅝	4 1/8/5
July-Sept.	9¼/9½	.....	5⅛/5¼
No. 2, Amber, spot.	7¾/8	4⅝/4¾	4 7/16/4⅝
Jan.-Mar.	7⅝/8	4¾/4 1/8	4⅛
Apr.-June	8¼/8½	4⅞/4 1/8	4¼/4 5/16
July-Sept.	8½/8¾	.....	4½/4 7/16
No. 3 Amber, spot.	7½/7¾	4½/4 1/16	4 /4 5/16
No. 1 Brown.	7¾/8	4¾	4 7/16
No. 2 Brown	7½/7¾	4⅝/4 1/16	4⅛
Brown, rolled	7¼/7⅜	4¼/4 7/16	3¾
PONTIANAK			
Bandjermasin	8	5	5
Pressed block	12	8	8½
Sarawak	12	5	5
PARAS			
Upriver fine	10¼	†5⅞	5¾
Upriver fine	*14¼	*9½	*9
Upriver coarse	6¾	†3	†3
Upriver coarse	*9¾	*5	*4⅞
Islands, fine	10	†5¼	†5¼
Islands, fine	*14	*9	*8¾
Acre, Bolivian, fine.	10½	6¾	6⅛
Acre, Bolivian, fine.	*14½	*10	*9½
Beni, Bolivian	10¾	6¼	6⅛
Madeira, fine	10¼	6	6

CAUCHO	Jan. 26, 1931	Dec. 26, 1931	Jan. 26, 1932
Upper ball	6	†3	†3
Upper ball	*9¾	*5	*4⅞
Lower ball	5½	†2½	†2½
Manicobas			
Manicoba, 30% guar.	†12	†4½	†4½
Mangabiera, thin sheet	†14	†4½	†4½
Guayule			
Duro, washed and dried	15	13	13
Ampar	16	14	14
Africans			
Rio Nuñez	..	..	8
Black Kassai	..	..	8
Manihot cuttings	..	..	4
Prime Niger flake	..	..	15
Accra flake	..	..	15
Gutta Percha			
Gutta Siak	13/13½	9	8½
Gutta Soh	26	17	17
Red Macassar	2.50	1.75	1.75
Balata			
Block, Ciudad Bolivar	30	20	19
Colombia	....	20	19
Manaos block	35	20	19
Surinam sheet	56	40	40
Amber	59	45	45

* Washed and dried crepe. Shipment from Brazil.
† Nominal.

"Tau Sagiz" Rubber Propaganda

George H. Carnahan[1]

THE newspaper reports regarding a vast new rubber source from the root of a plant called "towsagis," said to produce 40% latex, is not considered seriously by intelligent rubber planters.

The United States Department of Agriculture has identified "Tau Sagiz" as a species of *Scorzonera*, of which over 100 have been recognized in Europe and Asia. It is not native to the United States, but a variety commonly known as "black salsify," having a fleshy, edible root, is grown here as a garden vegetable, known as "oyster plant." The whitish fluid in this edible root might be called a latex, but it carries no rubber. This does not, of course, even indicate that the "latex" of "Tau Sagiz" does not carry rubber. In fact, there is strong presumptive evidence that it does.

The reports state that the roots of the plant "contain 40% latex" and that this "gave 95% pure rubber." In the latter connection it must be remembered that latex (milk) is a fluid and could hardly contain 95% of anything except water. It is quite probable that the report intended to say that the "rubber" recovered from the latex contained 95% of pure caoutchouc, which would make it a very high grade product, since commercial plantation (Hevea) rubbers of the best class contain only 92 to 94% caoutchouc—the chemically pure hydrocarbon.

There are over 200 plants that carry a latex containing rubber in varying amounts. The known range is from 1% in the latex of milkweed, fig trees, etc., to 33% in the case of tropical Hevea trees that now supply the world with 98% of all its rubber. Hence we must know the percentage of rubber in "Tau Sagiz" latex before we can appraise its productive capacity or the rubber content of the whole plant. In the guayule plant, now being extensively cultivated in Central California, the pure dry caoutchouc content of dry plants is approximately 15%, which is distributed throughout the trunk and the branches as well as the root.

From the Soviet point of view the commercial propagation and practical development of any rubber-bearing plant within the confines of their Union would spell success. Their well-known objective is to make themselves independent of all imported raw materials that, as in the case of rubber, are essential to modern warfare. If they are able to go even farther and create peacetime independence, they have a laudable objective that we would do well to recognize in our own situation and they can be counted on to make an intensive and intelligent drive to that end. However this does not mean that "Tau Sagiz" rubber can be produced at costs permitting export, although it does mean that their future automotive and petroleum industries would be insured against the ever-present menace of a contagious leaf disease attacking the congested plantations of the Middle East, on which we now depend for our own supplies of a commodity essential to our modern civilization.

[1]President, Continental Rubber Company of New York.

BLACK MAGIC

Trillions of tiny jet black particles, clinging tenaciously to the surrounding matter, toughening, strengthening, holding all together with vice-like grip—*Carbon Black*—product of the flame of natural gas.

Refined, tested, made uniform under a complete control, developed through twenty years of technical research, emerges

MICRONEX

the carbon black which made possible the modern high mileage tire.

For fifty years, through "Black Magic," Binney & Smith products have been ushering in a new era of quality and of beauty. As with tires, so with the whole range of rubber products.

Send for our booklets, "Black Magic" and "Twenty Years with Micronex." Tell us your problems. Our research laboratories are at your disposal.

Step onto the magic carpet—the Black Carpet—and let Black Magic weave its spell.

BINNEY & SMITH COMPANY
41 East 42nd Street
NEW YORK

Compounding Ingredients

THE expected revival of tire manufacturing business has failed to materialize. Production is proceeding steadily in manufacturing centers on a basis thought to be considerably below half capacity. Similarly in other lines of rubber goods production lack of demand is causing curtailment of operations. Footwear output is hindered by the absence of seasonable cold and snowy weather; insulation by the lack of building construction; and other lines by other special causes. The one rubber line that is actually busy is that of automobile sundries. The movement of compounding supplies under the circumstances is reduced to the numerous small orders of hand-to-mouth variety.

ACCELERATORS. The moderate priced high powered accelerators are maintaining their popularity presumably because they go further for the money spent.

AGE RESISTERS. The estimate of the industry for the essential need of age resisters is presumably about half that for accelerators since their annual consumption as compared to that of accelerators is estimated at that ratio by an authority.

CARBON BLACK. The new contracts for 1932 set the price of carbon black at 3 cents a pound f.o.b. Texas basis. The rubber trade demand is small thus far and of hand-to-mouth order. In general the market is dull.

LITHARGE. The sharp decline in the price of pig lead was reflected in the reduction of cask litharge to 5¾ cents a pound and the lowering of cash discounts from 2 to 1 per cent. The trade in general was quiet.

LITHOPONE. Consuming demand is at low ebb, but prices are steady and unchanged.

SOFTENERS. The generally used softeners are well enough established to find a steady though slow market. Stearic acid has met with a decline in price of ½-cent a pound on single and double pressed and ¾-cent on triple pressed. The single pressed grade is the one generally used in rubber work. Degras, the special utility softener for mechanicals and reclaim, is in fair demand and the price steady.

SOLVENTS. Buying is reported light and the price soft at 5½ cents a gallon on light and standard grades in tank cars.

ZINC OXIDE. The market is quiet, with consuming demand light and prices unchanged.

New York Quotations

January 26, 1932

Prices Not Reported Will Be Supplied on Application

Abrasives		
Marble flour	ton	$20.00
Pumicestone, pwd.	lb.	.02½ / $0.04
Rottenstone, domestic	ton	23.50 / 28.00
Rottenstone, English	lb.	
Silica, spot, l. c. l.	lb.	.01¾ / .03
Accelerators, Inorganic		
Lime, hydrated	ton	20.00
Magnesia, calcined, heavy	lb.	.06
carbonate	lb.	.06 / .07
Accelerators, Organic		
Aldehyde ammonia	lb.	.65 / .70
Altax	lb.	
Ambrex	lb.	
Barak	lb.	
BLE	lb.	
Butene	lb.	
Captax	lb.	
Crylene	lb.	
paste	lb.	
DBA	lb.	
Di-esterex N.	lb.	
DOTG	lb.	.42 / .44½
DPG	lb.	.30 / .32½
Ethylidine aniline	lb.	.45 / .47½
Formaldehyde aniline	lb.	.37½ / .40
Grasselerator 808	lb.	
833	lb.	
Heptene	lb.	
base	lb.	
Hexamethylenetetramine	lb.	.46 / .47
Hydrone	lb.	
Lead oleate, No. 999	lb.	.11
Witco	lb.	.10
Lithex	lb.	
Methylene dianiline	lb.	
Monex	lb.	
Novex	lb.	
Phenex	lb.	.50 / .55
Plastone	lb.	
R & H 40	lb.	
50	lb.	
50-D	lb.	
397	lb.	
Retardex	lb.	.35 / .40
Safex	lb.	
SPDX	lb.	.70 / .75
Super-sulphur No. 1	lb.	
No. 2	lb.	
Tensilac 39	lb.	.40 / .42½
Thermlo F.	lb.	
Thiocarbanilid	lb.	.25 / .27
Thionex	lb.	
TMTT	lb.	
Trimene	lb.	
base	lb.	
Triphenyl guanidine	lb.	.58 / .60
Tuads	lb.	
Ulto	lb.	3.00
Vulcanex	lb.	
ZBX	lb.	
Zimate	lb.	
Acids		
Acetic 28% (bbls.)	100 lbs.	2.40 / 2.65
glacial (carboys)	100 lbs.	8.75 / 9.10
Sulphuric, 66°	ton	15.50
Age Resisters		
Age-Rite Gel	lb.	
powder	lb.	
resin	lb.	
white	lb.	
Albasan	lb.	
Antox	lb.	
Stabilite	lb.	$0.57 / $0.62
Alba	lb.	.70 / .75
VGB	lb.	
Zalba	lb.	
Antisun Materials		
Heliozone	lb.	
Sunproof	lb.	
Binders, Fibrous		
Cotton flock, dark	lb.	.08½ / .10
dyed	lb.	.50 / .85
white	lb.	.11 / .16
Colors		
BLACK		
Bone, powdered	lb.	.05½ / .15
Carbon (see Reenforcers)		
Drop (bbls.)	lb.	.05½ / .17
Lampblack (commercial)	lb.	.07 / .08
BLUE		
Blue toners	lb.	.60 / 3.85
Brilliant blue	lb.	3.50
Prussian	lb.	.35 / .37
Ultramarine	lb.	.06 / .30
BROWN		
Iron oxide	lb.	
Mapico	lb.	.17
Sienna, Italian, raw, powdered	lb.	.04½ / .11
GREEN		
Brilliant green	lb.	3.50
Chrome, light	lb.	.23 / .25½
medium	lb.	.26 / .27½
Chrome oxide	lb.	.23 / .26
Dark green	lb.	1.30
Green toners	lb.	1.00 / 3.60
Light green	lb.	.70
ORANGE		
Cadmium sulphide	lb.	.65 / .75
Orange lake	lb.	.50
Orange toners	lb.	1.60
ORCHID		
Orchid toners	lb.	1.05 / 1.75
PINK		
Pink toners	lb.	1.00 / 1.80
PURPLE		
Permanent purple	lb.	1.80
Purple toners	lb.	.60 / 1.90
RED		
Antimony		
Crimson, R. M. P. No. 3	lb.	.48
Sulphur free	lb.	.50
7-A	lb.	.35
Z-2	lb.	.22
Cadmium	lb.	.70
Chinese red	lb.	.85
Crimson red	lb.	.85
Iron Oxides		
FER-OX brand, f.o.b. New Castle, Pa.	lb.	.08¾
Rub-er-red	lb.	.08¾
Mapico	lb.	.09
Medium red	lb.	.85
Red toners	lb.	$0.95 / $2.75
Scarlet red	lb.	1.50
Spanish red oxide	lb.	.02 / .03¼
WHITE		
Lithopone	lb.	.04¾ / .05
Albalith, l. c. l.	lb.	.04¾ / .05
Cryptone No. 19, l. c. l.	lb.	.06¾ / .07
Grasselli (50 lb. bags)	lb.	.04½ / .04¾
(400 lb. bbls.)	lb.	.04¾ / .05
Titanium oxide, pure	lb.	.20
Titanox "B"	lb.	.06¾ / .07
"C"	lb.	.06¾ / .07
Zinc Oxide		
Black label (lead free) c. l., bags	lb.	.06½
Green label (lead free) c. l., bags	lb.	.06½
Green seal, l. c. l.	lb.	.10⅝ / .10⅞
Green seal, Anaconda	lb.	.10⅜ / .10⅞
Kadox, black label, l. c. l.	lb.	.10⅝ / .10⅞
blue label, l. c. l.	lb.	.09⅜ / .09⅞
red label, l. c. l.	lb.	.08¾ / .08½
Red label (lead free) c. l., bags	lb.	.06½
Red seal, l. c. l.	lb.	.09⅜ / .09⅞
Red seal, Anaconda	lb.	.09⅜ / .09⅞
Special, l. c. l.	lb.	.07¾ / .07½
White seal (bbls.), l. c. l.	lb.	.11⅞
White seal, Anaconda	lb.	.11⅜ / .11⅞
XX green, l. c. l.	lb.	.07¼ / .07½
XX red, l. c. l.	lb.	.06¾ / .07
Zinc sulphide, l. c. l. (bbls.)	lb.	.13½
YELLOW		
Cadmium sulphide	lb.	.65 / .75
Chrome	lb.	.16
Lemon yellow	lb.	1.50
Mapico	lb.	.12
Ochre, domestic	lb.	.01⅜ / .02½
Yellow toners	lb.	2.50
Deodorant		
Rodo	lb.	
Factice—See Rubber Substitutes		
Fillers, Inert		
Asbestine	ton	13.40 / 13.50
Barytes, white, spot	ton	33.00
off color, spot	ton	
Foam "A" (f.o.b. St. Louis)	ton	23.00
Blanc fixe, dry, precip., c. l.	ton	75.00 / 77.50
pulp	ton	42.50 / 45.00
Infusorial earth	ton	40.00 / 80.00
Kalite No. 1	ton	30.00 / 60.00
No. 3	ton	40.00 / 70.00
Suprex white, extra light	ton	60.00 / 80.00
heavy	ton	45.00 / 55.00
Whiting		
Chalk, imported	100 lbs.	1.00 / 1.50
Domestic	100 lbs.	1.00
Paris white, English cliffstone	100 lbs.	1.50
Quaker	ton	
Sussex	ton	
Witco (l. c. l.) (f.o.b. New York)	ton	20.00

Fillers for Pliability			
Flex	lb.		
Fumonex	lb.	$0.02½/	$0.06
P-33	lb.		
Thermax	lb.		
Velvetex	lb.	.02 /	.05
Finishes			
Mica, amber	lb.	.04½	
Starch, corn, pwd...100	lbs.	2.44 /	2.64
potato	lb.	.06½	
Talc, dusting	lb.	.01¾	
French	ton	18.00 /	22.00
Italian	lb.	.02½/	.03
Pyrax A	ton		
Inflating Material			
Sponge paste	lb.	.30	
Mineral Rubber			
Genasco (fact'y)	ton	40.00 /	42.00
Gilsonite (fact'y)	ton	37.26 /	39.65
Granulated M. R.	ton		
Hydrocarbon, hard	ton		
Parmr Grade 1	ton	23.00 /	28.00
Grade 2	ton	23.00 /	28.00
Mold Lubricants			
Sericite	lb.		
Soapbark (cut)	lb.	.07½/	.08
Soapstone	lb.	.01	
Oils			
Castor	lb.	.12½	
Poppy seed oil	gal.	1.70	
Red oil, distilled	lb.	.06¾/	.07⅛
Protective Colloids			
Bentonite (dispersion clay)	lb.	.02 /	.02¼
Casein, domestic	lb.	.07½	
Reenforcers			
Aluminum flake (sacks, c. l.)	ton	21.85	
(sacks, l.c.l.)	ton	24.50	
Carbon Black			
Aerfloted arrow black	lb.	.03 /	.07
Century (works, c. l.)	lb.	.03	
Certified, Cabot, c. l., f. o. b. works, bags	lb.	.03	
c. l., f. o. b. works, cases	lb.	.04½	
l. c. l., f. o. b. works	lb.	.05½/	.07
Disperso (works, c. l.)	lb.	.03	
Dixie brand	lb.	.03 /	.07
Elastex	lb.	.03 /	.07
Gastex (f. o. b. fact'y)	lb.	.02½/	.05
Kosmos brand	lb.	.03 /	.07
Micronex	lb.	.03 /	.07
Ordinary (compressed or uncompressed)	lb.	.03 /	.07
Clays			
Bento	lb.		
Blue Ridge, dark	ton		
Dixie	ton		
Dusto	lb.		
Langford	ton		
Lexo (works)	ton		
Par	ton		
Perfection	ton	20.00	
Suprex No. 1	ton	8.00	
No. 2, dark	ton	6.50	
Glue, high grade	lb.	.20 /	.25
Rubber Substitutes or Factice			
Amberex	lb.	.15	
Black	lb.	.07 /	.09
Brown	lb.	.05½/	.11
White	lb.	.08 /	.13
Softeners			
Burgundy pitch	lb.	.06	
Degras	lb.	.03½/	.04½
Fluxol	ton	18.00 /	80.00
Palm oil (Witco)	lb.	.07½	
Para-flux	gal.	.15	
Petrolatum, snow white	lb.	.07 /	.07¼
Rosin oil, compounded	gal.	.35	
Rubberseed, drums	lb.	.07¾	
Rubtack	lb.	.10	
Tonox	lb.		
Witco No. 20	gal.	.08	
Solvents			
Benzol (90% drums)	gal.	.25	
Carbon bisulphide (drums)	lb.	.05½/	.12
tetrachloride	lb.	.06½/	.07
Dip-Sol	gal.		
Dryolene, No. 9	gal.		
Petrobenzol	gal.		
Rub-Sol	gal.		
Solvent naphtha (tanks)	gal.	.26	
Stod-Sol	gal.		
Troluoil	gal.		
Turpentine, dest distilled	gal.	.35 /	.36
Stabilizers			
Laurex, ton lots	lb.		
Stearates			
Aluminum	lb.		
Calcium	lb.		
Magnesium	lb.	.25	
Zinc	lb.	.25	
Stearex B	lb.	.08 /	.12
Stearex flake	lb.	.09 /	.13
Stearic acid, dbl. pres'd.	lb.	.07½/	.08
Vulcanizing Ingredients			
Sulphur			
Sulphur chloride, drums	lb.	.03¾/	.04
Telloy	lb.		
Vandex	lb.		
(See also Colors—Antimony)			

Foreign Trade Circulars

Special circulars containing foreign rubber trade information are now being published by the Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C.

Number	Special Circulars
3160	French tire exports, October, 1931.
3161	French footwear exports, October, 1931.
3171	United States renewal tire market analysis.
3172	British exports of automobile casings, November, 1931.
3173	British footwear exports, November, 1931.
3174	French tire exports, November, 1931.
3175	French footwear exports, November, 1931.
3176	Canadian tire exports, November, 1931.

United States Crude and Waste Rubber Imports for 1931 by Months

	Plantations	Latex Paras	Africans	Centrals	Guayule	Manicobas and Matto Grosso	Totals 1931	Totals 1930	Balata	Miscellaneous	Waste
Jan. ...tons	36,525	206 331	36	..	..	..	37,098	47,362	65	960	38
Feb. ...	35,749	339 516	40	1	..	..	36,645	43,728	1	580	..
Mar. ...	38,922	352 1,062	2	..	..	..	40,338	45,430	170	800	
Apr. ...	46,034	323 291	..	..	..	..	46,648	49,927	196	908	60
May ...	30,962	248 508	2	..	..	..	31,720	40,745	78	450	2
June ...	44,495	601 640	40	..	..	..	45,776	42,653	271	892	6
July ...	40,477	316 211	..	..	..	..	41,004	34,084	131	519	6
Aug. ...	37,920	328 121	1	..	..	..	38,370	34,558	82	375	13
Sept. ...	39,831	341 294	39	..	..	..	40,505	39,467	89	592	20
Oct. ...	40,462	238 695	..	..	..	..	41,395	43,729	28	719	36
Nov. ...	43,079	208 410	36	..	..	..	43,733	31,765	76	652	
Dec. ...	51,165	230 536	..	..	..	..	51,931	34,895	91	678	5
Total, 12 mos., 1931 ...tons	485,621	3,730 5,615	196	1	..	..	495,163	.....	1,278	8,125	186
Total, 12 mos., 1930 ...tons	475,803	3,822 7,172	337	198	1,011	..	.....	488,343	1,315	8,633	476

Compiled from The Rubber Manufacturers Association, Inc., statistics.

Rims Approved by The Tire & Rim Association, Inc.

Rim Size	Twelve Months, 1930 Number	Per Cent	Twelve Months, 1931 Number	Per Cent
Motorcycle				
24x3	517	0.0	404	0.0
28x3 CC	592	0.0	1,437	0.0
Clincher				
30x3½	77,617	0.4	31,500	0.3
31x4	150	0.0	.....	...
17" Balloon				
17x3.25	7,747	0.0	31,872	0.3
17x4	1,008	0.0	94,694	0.8
17x4½	15,592	0.1	164,062	1.4
17x5	9,188	0.1	8,120	0.1
18" Balloon				
18x3.00	231	0.0	4,207	0.0
18x3½	868	0.0	.....	...
18x4	1,008,872	5.8	227,022	1.9
18x3.25	119,319	0.7	135,733	1.1
18x4½	126,599	0.7	20,559	0.2
18x5	82,911	0.5	45,170	0.4
18x6	16,745	0.1	18,783	0.1
19" Balloon				
19x2.75	2,430,685	14.0	97,686	0.8
19x3.00	640,859	3.7	98,454	0.8
19x3½	189,166	1.1	5,831	0.0
19x4	1,550,741	8.9	452,448	3.8
19x3.25	25,923	0.1	4,489	0.0
19x4½	560,400	3.2	284,233	2.4
19x5	138,435	0.8	69,766	0.6
19x6	6,067	0.0	.....	...
20" Balloon				
20x2.75	32,500	0.2	49,832	0.4
20x3½	58,688	0.3	18,281	0.2
20x4	133,501	0.8	31,528	0.3
20x4½	119,189	0.7	19,684	0.2
20x5	16,622	0.1	20,228	0.2
20x6	2,406	0.0	4,569	0.0
21" Balloon				
21x3½	180,516	1.0	73,187	0.6
21x2.75	1,847	0.0	2,010	0.0
21x4	26,365	0.2	12,122	0.1
21x4½	37,615	0.2	16,116	0.1
21x5	1,966	0.0	2,066	0.0
21x6	5,373	0.0	2,522	0.0
22" Balloon				
22x4	1,358	0.0	153	0.0
22x4½	1,011	0.0	106	0.0
Drop Center				
17x3.00 D	19	0.0	10	0.0
17x3.25 E	22	0.0	35,164	0.3
17x3.62 F	29	0.0	90,361	0.8
17x4.00 F	.....	...	6,359	0.1
17x4.19 F	.....	...	25,079	0.2
18x2.15 B	67,715	0.4	21,667	0.2
18x3.00 D	83	0.0	316,017	2.6
18x3.25 F	25,641	0.1	707,864	5.9
18x3.62 F	.....	...	111,654	0.9
18x4.00 F	.....	...	135,692	1.1

Rim Size	Twelve Months, 1930 Number	Per Cent	Twelve Months, 1931 Number	Per Cent
Drop Center (*Continued*)				
18x4.19 F	.....	...	16,840	0.1
19x2.15 B	32,273	0.2	8,958	0.1
19x2.75 D	39,622	0.2	5,382	0.0
19x3.00 D	6,114,088	35.2	5,887,386	48.5
19x3.25 E	3,885	0.0	81,224	0.7
19x3.62 F	.....	...	6,646	0.0
19x4.00 F	8,141	0.0	33,703	0.3
20x2.75 D	.....	...	423	0.0
20x4.00 F	10,592	0.1	.....	...
Semi Drop Base Split				
17x3.00 D	.....	...	28	0.0
17x3.25 E	5,404	0.0	14,759	0.1
17x3.62 F	.....	...	9,453	0.1
18x3.00 D	25	0.0	25	0.0
18x3.25 E	33,832	0.2	26,241	0.2
19x3.00 D	125,359	0.7	126,269	1.0
19x3.62 F	.....	...	20	0.0
High Pressure				
30x3½	16,243	0.1	14,279	0.1
32x4	8,764	0.1	5,707	0.0
32x4½	12,190	0.1	5,197	0.0
34x4½	4,324	0.0	197	0.0
18" Truck				
28x5	3,103	0.0	14,499	0.1
32x7	537	0.0	10,736	0.1
34x8	227	0.0	1,672	0.0
20" Truck				
30x5	2,479,664	14.3	1,895,184	15.6
32x6	307,097	1.8	185,272	1.5
34x7	206,171	1.2	119,146	0.9
36x8	104,148	0.6	66,811	0.5
9-10x20	11,859	0.1	10,698	0.1
40x10.50	1,218	0.0	1,818	0.0
42x11	938	0.0	2,122	0.0
22" Truck				
36x7	2,190	0.0	2,455	0.0
38x8	16,962	0.1	9,764	0.1
9-10x22	2,055	0.0	3,626	0.0
24" Truck				
34x5	3,436	0.0	1,933	0.0
36x6	9,371	0.1	3,999	0.0
38x7	19,479	0.1	12,192	0.1
40x8	50,131	0.3	41,737	0.3
9-10x24	5,419	0.0	10,516	0.1
44x10	383	0.0	.....	...
46x11	313	0.0	671	0.0
Airplane				
18x3	563	0.0	200	0.0
24x3	433	0.0	.....	...
24x4	514	0.0	109	0.0
32x6	209	0.0	.....	...
36x8	103	0.0	.....	...
44x10	125	0.0	124	0.0
58x14	8	0.0	.....	...
Totals	17,364,096	...	12,136,762	...

Cotton and Fabrics

JANUARY has been rather a featureless month in cotton. Prices have not changed much, and no new statistical or economic developments have occurred.

The cotton industry, like all other business, is keenly interested in the results expected to follow upon certain domestic and foreign developments. The passage of the President's plan for a $2,000,000,000 credit corporation is looked upon as a constructive step which, if it accomplishes its purpose of releasing frozen credits, will help all business. Political news in Germany, France, and England is also being watched for indications of agreement among European nations on fundamental problems.

At home the principal concern has been with the overproduction of cotton goods. The movement started toward the end of last year, but immediate steps were taken to halt the tendency.

The year-end holidays, with their consequent shutting of mills helped to cut production somewhat; but reports were received from reliable sources saying that several manufacturers were continuing to produce on day and night shifts.

News of a meeting of all except one of the large producers at Greenville, S. C., indicated a plan was approved to cut print cloth production 20% starting March 1 and continuing 6 months. If consummated this arrangement will mean a decrease of 100,000,000 yards in print cloth output for 6 months.

Attention in the next few months will be centered upon the possibilities of reducing the acreage devoted to cotton and to climatic conditions during the growing season. The market has absorbed all its unfavorable statistical news up to the present; and if the curtailment in next year's crop is at all within expectations, the market will be in a much better position.

Week ended January 2. The cotton market bowed the old year out with a drop of from 3 to 9 points on December 31, making the year-end prices about the same that they had been at the close of the preceding week. January closed at 6.33; March at 6.44; July at 6.77; and October at 7.03.

The three-day holiday, from Friday to Monday, was reflected in the trading, which was quiet on the whole, except for a large selling order in the May contract on the 31st, which undermined prices more than 2 days of trading had done.

COTTON BEAR POINTS

1. A carryover of 13,500,000 bales of United States cotton is estimated for next season.
2. A carryover of 5,000,000 bales of foreign cotton is estimated for next season.
3. Russian cotton is threatening American cotton trade in Great Britain.
4. The cotton spinning industry operated at 79.8% capacity in December, against 85.8% in November and 76.1% in December, 1930.
5. Ginnings of cotton prior to January 16, 1932, were 15,992,294 running bales, against 13,552,104 the previous year and 14,176,936 in 1929.
6. Sales of cotton cloth during December were 80.4% of production; shipments were 93.4% of output.
7. Stocks of cotton cloth increased 6.2% in December, and unfilled orders dropped 9.3%.

COTTON BULL POINTS

1. It is hoped that manufacturers will agree upon curtailed production.
2. Producers continue the holding movement.
3. Fertilizer tag sales are light.
4. Forwardings to mills of the world to date are 7,000,800 bales, against 5,782,000 in 1931 and 7,497,000 in 1930.
5. Exports to date are 4,596,000 bales, against 4,341,000 in 1931 and 4,741,000 in 1930.
6. Supplies of cotton in foreign countries are expected to be 1,000,000 bales less than last year.
7. Sales of cotton cloth for 1931 were 3.6% greater than production; shipments were 2.5% greater.
8. Stocks on hand during 1931 dropped 20.3%; unfilled orders gained 11.5%.
9. Production during December was 12% below that of November.
10. Consumption of cotton during December was 415,517 bales, against 428,870 in November and 405,418 in December, 1930.

On Tuesday it was reported that an increase in buying called for more contracts than were released by producers. There seems to be some confidence expressed in the efficacy of the southern holding movement.

A good many reviews are naturally dealing with the action of the cotton market during the past year, and predictions as to its course in the future are also being made, but conservatively.

The large surplus overshadows most other factors. The recent meeting of representatives of all the southern states where it was generally agreed to cut next year's acreage 50% was encouraging, but some doubt has been expressed as to the method for enforcing the agreement. Then the Federal Farm Board, in cooperation with southern bankers, has pledged itself to withhold about 7,000,000 bales from the market until July, 1932, if the acreage cut materializes.

World production of cotton in 1931 is put at 28,000,000 bales; 16,918,000 bales is American cotton. The carryover of the American crop was about 9,000,000 bales on July 31, which brings the total supply to about 26,000,000 bales. For the year ending July 31, 1932, it is estimated that 12,500,000 bales will be consumed, leaving a carryover of 13,500,000 bales into next season. The foreign carryover will be about 5,000,000 bales at the end of the season, making a total of 18,500,000 bales on July 31, 1932, against 14,000,000 on July 31, 1931.

Prices at the close of January 2 were:

Position	High	Low	Close	Previous Close
Jan.	6.40	6.33	6.33/34	6.38
Mar.	6.52	6.44	6.44/46	6.49/50
May	6.69	6.56	6.56/61	6.65/67
July	6.88	6.77	6.77/78	6.84/85
Oct.	7.13	7.03	7.03/04	7.06/08
Dec.	7.25	7.17	7.17	7.23

New York Quotations

January 26, 1932

Drills	Cents
38-inch 2.00-yd. ..... yd.	$0.09
40-inch 3.47-yd.	.05⅞
50-inch 1.52-yd.	.12¼
52-inch 1.90-yd.	.10
52-inch 2.20-yd.	.08⅝
52-inch 1.85-yd.	.10¼
Ducks	
38-inch 2.00-yd. D. F. ..... yd.	.09
40-inch 1.45-yd. S. F.	.13
72-inch 1.05-yd. D. F.	.20
72-inch 16.66-oz.	.21
72-inch 17.21-oz.	.22
MECHANICAL	
Hose and belting ..... lb.	.19
TENNIS	
52-inch 1.35-yd. ..... yd	.14
Hollands	
RED SEAL	
36-in. ..... yd.	.12
40-in.	.12½
50-in.	17½
GOLD SEAL	
40-in., No. 72 ..... yd.	.14½

Tire Fabrics	Cents
BUILDER	
17¼ oz. 60" 23/11 ply Karded peeler ..... lb.	$0.23
17¼ oz. 60" 10/5 ply Karded peeler ..... lb.	.21
CHAFER	
14 oz. 60" 20/8 ply Karded peeler ..... lb.	.23
12 oz. 60" 10/4 ply Karded peeler ..... lb.	.19
9¾ oz. 60" 20/4 ply Karded peeler ..... lb.	.25
9¾ oz. 60" 10/2 ply Karded peeler ..... lb.	.21
CORD FABRICS	
23/3/3 Karded peeler, 1 3/32" cotton.. lb.	.23
23/4/3 Karded peeler, 1 3/32" cotton.. lb.	.25
15/3/3 Karded peeler, 1 3/32" cotton.. lb.	.21
13/3/3 Karded peeler, 1 3/32" cotton.. lb.	.20
7/2/2 Karded peeler, 1 1/16" cotton.. lb.	.20
23/5/3 Karded peeler, 1¼" cotton.. lb.	.28
23/5/3 Karded Egyptian, Egyptian upper cotton ..... lb.	.25
23/5/3 Combed Egyptian..... lb.	.41
LENO BREAKER	
8¼ oz. and 10¼ oz. 60" Karded peeler ..... lb.	.23

Osnaburgs	Cents
40-in. 2.35-yd. ..... yd.	$0.07⅞
40-in. 2.48-yd.	.07¼
40-in. 3.00-yd.	.06⅛
40-in. 10-oz. part waste.....	.08¼
40-in. 7-oz.	.06⅛
37-in. 2.42-yd.	.07⅝
Raincoat Fabrics	
COTTON	
Bombazine 64 x 60..... yd.	.08¼
Bombazine 60 x 48	.07¼
Plaids 60 x 48	.09¼
Plaids 48 x 48.....	.07¾
Surface prints 64 x 60	.10¼
Surface prints 60 x 48.....	.09¾
Print cloth, 38½-in., 64 x 60.....	.03⅜
Print cloth, 38½-in., 60 x 48.....	.02¾
SHEETINGS, 40-INCH	
48 x 48, 2.50-yd. ..... yd.	.05¾
48 x 48, 2.85-yd.	.05⅛
64 x 68, 3.15-yd.	.05½
56 x 60, 3.60-yd.	.04¾
44 x 48, 3.75-yd.	.04¼
44 x 40, 4.25-yd.	.03¾
SHEETINGS, 36-INCH	
48 x 48, 5.00-yd. ..... yd.	.03¼
44 x 40, 6.15-yd.	.02¾

Week ended January 9. Continuing on a level which has been maintained for the last month, prices in the cotton market were virtually unchanged for the week. January contracts closed at 6.38 cents, compared with 6.33 at the close of the previous week; March was 6.49 cents against 6.44; May, 6.64 cents against 6.56; July, 6.81 cents against 6.77; October, 7.07 cents against 7.03; and December, 7.19 cents against 7.17 last week.

The firm holding movement in the South is responsible for the steadiness in prices; while improved buying during the past week and a strong trade demand helped to hold prices up. The stock market had a beneficial influence on the market after it registered a 3-day rise. The fluctuations in the market were only slight and reflected profit-taking principally.

The curtailment in cotton mill activity during the holiday week was carried over to some extent although the index of the activities in the mills showed a slight rise. The New York Cotton Exchange reported light sales, but trade reports reveal better inquiry in the present week for certain constructions.

Exports have now overtaken last year's figures. To date the season's total is 4,229,000 bales, against 4,144,000 last year and 4,437,000 2 years ago. Heavy into-sight figures for the last week brought the total to approximately 10,500,000 bales, 18,000 more than at the same time in 1931, after trailing last year's figures by almost 1,000,000 bales up to 2 months ago.

Indications are that the Indian crop will be one of the smallest in recent years. Considerable attention was attracted by the Bremen market which was unusually firm all week.

Prices at the close of January 9 were:

Position	High	Low	Close	Previous Close
Jan.	6.45	6.37	6.38	6.38
Mar.	6.55	6.48	6.49/50	6.48/49
May	6.72	6.64	6.64	6.63/65
July	6.90	6.81	6.81/82	6.81/82
Oct.	7.14	7.05	7.07	7.04/05
Dec	7.28	7.19	7.19	7.17/18

Week ended January 16. Prices on the cotton market climbed about ¼-cent, except the October position which was up only 18 points. What was characterized as the best buying in 1932, together with a strong holding movement in the South, gave the market a stronger and more optimistic tone.

January contracts closed at 6.64 cents against 6.38 at the end of the previous week; March closed at 6.73 cents against 6.49; July was 7.04 cents against 6.81; October, 7.25 cents against 7.07; and December, 7.44 cents against 7.19.

Publication of year-end statistics revealed many favorable factors. Sales of carded cotton cloths during 1931 were 3.6% higher than production, and shipments gained 2.5% over production. The Association of Cotton Textile Merchants reported the year's output as 2,784,402,000 yards, compared with 2,819,723,000 yards in 1930. Stocks of cloth on hand at the end of the year were 290,248,000 yards, a 20.3% decrease from the previous year's total. Unfilled orders gained 11.5%, and totaled 322,039,000 yards on December 31. The December figures showed production dropped 12% below the November rate;

WEEKLY AVERAGE PRICES OF MIDDLING COTTON

Week Ended	Cents per Pound
Jan. 2	6.50
Jan. 9	6.43
Jan. 16	6.68
Jan. 23	6.76

shipments were 93.4% of production; sales 80.4% of production; stocks on hand increased 6.2%; unfilled orders decreased 9.3% for the month.

"While shipments and sales seldom equal production during December because of the reluctance of purchasers to increase their year-end inventories," the Association stated, "both of these items were substantially greater than during December, 1930, shipments being 5% more and sales 12% more."

The week's statistical comparisons released by the New York Cotton Exchange showed that exports from the United States for the season totaled 4,370,000 bales, against 4,242,000 bales last year. Forwardings to mills of the world were 6,654,000 bales, against 5,603,000.

Cotton cloth production increased for the week after a 2-week drop, but rumors were current that additional curtailment plans were being considered.

Prices at the close of January 16 were:

Position	High	Low	Close	Previous Close
Jan.	6.62	6.57	6.64	6.58
Mar.	6.74	6.66	6.73/74	6.68/70
May	6.89	6.81	6.88/89	6.86
July	7.05	6.98	7.04/05	7.03
Oct.	7.28	7.20	7.25	7.28
Dec.	7.45	7.37	7.44/45	7.42

Week ended January 23. The heavy buying movement carried over into Monday of this week, eased off on Tuesday and Wednesday, was firmer on Thursday, but grew softer on Friday and Saturday.

The net loss for the week was only from 6 to 12 points. The March position closed the week at 6.64 cents, against 6.74 cents at the close of the previous week; May was 6.79 cents compared with 6.89; July, 6.96 cents against 7.05; October, 7.20 cents against 7.25; and December at 7.38 cents against 7.45.

The heavy ginning total published by the Bureau of Census Saturday morning was partly responsible for the slight drop of 3 points in the day's trading. Ginnings to January 16 were 15,992,294 running bales of cotton, compared with 13,592,104 the previous year, and 14,176,936 in 1929.

It was also reported during the week that the cotton spinning industry was operated during December at 79.8% of capacity, on a single shift basis, compared with 85.8% in November, 76.1% in December, 1930, and 88.2% in December, 1929. Active spindle hours for December were 184 a spindle in place, against 186 for November, and 176 for December, 1930.

The output of cotton cloth last week increased less than is usual; *The New York Herald-Tribune* index, therefore, dropped to 90.2 from 92.0 in the preceding week. For the same week last year the index stood at 76.9%.

Cheer was taken from the report of the New York Cotton Exchange Service which said, "The mills of this country sold more cloth last week than in any other week for several months."

The week's statistics show that exports to date are 4,596,000 bales, against 4,341,000 last year, and 4,741,000 in 1930. Forwardings to mills of the world were 7,000,800 to date, against 4,782,000 bales last year, and 7,497,000 in 1930.

Progress toward control of cloth output was made at a meeting of producers in Greenville, S. C. Another meeting will be held next week, when it is hoped that a 20% reduction will be adopted which will cut output 100,000,000 yards in 6 months.

Prices at the close of January 23 were:

Position	High	Low	Close	Previous Close
Mar.	6.65	6.63	6.63	6.64/65
May	6.81	6.77	6.78	6.80/81
July	6.97	6.95	6.95/96	6.97/98
Oct.	7.20	7.18	7.19	7.21
Dec.	7.37	7.36	7.36	7.37
Jan.	7.45	7.44	7.43	...

On January 25 the ginning reports of last week failed to have any effect on the situation. It is a market of small changes, largely local, with a tendency to wait developments.

On January 26 spot cotton was steady at a decline of 5 points. Middlings were 6.70 cents.

Cotton Fabrics

DUCKS, DRILLS, AND OSNABURGS. Market conditions on these goods last month were practically the same as in the month previous. No price movements occurred although a little greater resistance to declines is noted in the price of cotton fabrics. Time is serving as an influence in favor of the producers. Late Winter and early Spring will probably reveal a sharp demand for textiles for quick shipment.

RAINCOAT FABRICS. The demand for fabrics has scarcely begun for the spring raincoat lines. Selection and preparation of styles and materials are the current order of the day with raincoat manufacturers.

SHEETINGS. Since the first of the year the print cloth market has been very active; so prices improved considerably with the broad distribution of merchandise. Sheetings also have shown activity and have improved their position both as to price and stock. The good business of January is expected to continue.

TIRE FABRICS. In general tire fabrics of all varieties were sparingly purchased by consuming interests during January. There was very little of actual new business, but reports from Detroit and the improved automobile prospects revealed by the New York automobile show served to indicate the easy movement of goods to meet the demand for tires.

Price Differentials

Price differentials between the various grades of Hevea plantation rubber which shall prevail on all deliveries against new "A" contracts, for February, 1932, follow: No. 2 crepe (thick or thin) at 1 point: No. 2 ribbed smoked sheets at 8 points; No. 3 ribbed smoked sheets at 18 points; No. 4 ribbed smoked sheets at 30 points; No. 5 ribbed smoked sheets at 50 points; limit of allowance on No. 2 crepe at 25 points; allowance on rubber delivered in bales at 13 points.

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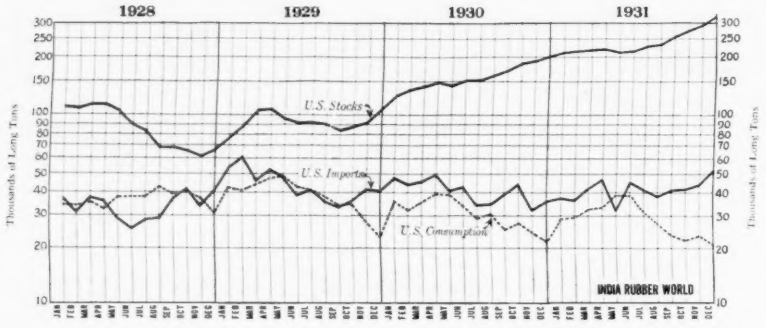
Imports, Consumption, Stocks



United States Stocks, Imports, and Consumption

IMPORTS of crude rubber for December totaled 51,931 long tons, the highest for any single month since April, 1929. December arrivals were 18.7% greater than November this year, and 48.8% above December a year ago, according to R. M. A. statistics.

Consumption of crude rubber by manufacturers in the United States for December amounted to 21,409 long tons, making a total for the year of 348,986 long tons, as compared with 375,980 long tons for 1930. The December consumption shows a decrease of 6.7% as compared with November, although the seasonal decline for the previous 5 years for December under November has been 8.7%.

The Association estimates total domestic stocks of crude rubber on hand December 31 at 322,826 long tons, an increase of 10.4% over November this year and 60.6% over December 31, 1930.

Crude rubber afloat for United States ports on December 31 is estimated at 53,940 long tons as against 77,443 long tons on November 30, 1931, and 56,035 long tons on December 31, 1930.

London and Liverpool Stocks

Week Ended	Tons London	Tons Liverpool
Jan. 2	69,504	57,718
Jan. 9	68,967	57,652
Jan. 16	68,272	58,662
Jan. 23	67,545	58,328

United States and World Statistics of Rubber Imports, Exports, Consumption, and Stocks

Twelve Months	U. S. Net Imports* Tons	U. S. Consumption Tons	U. S. Stocks on Hand† Tons	U. S. Stocks Afloat† Tons	United Kingdom Stocks†‡ Tons	Singapore and Penang Stocks, Etc.†‡ Tons	World Production (Net Exports)‡ Tons	World Consumption Estimated‡ Tons	World Stocks†‡§ Tons
1926	411,962	358,415	72,510	51,238	50,074	26,443	614,778	533,915	149,026
1927	431,807	372,528	100,130	47,938	65,663	25,798	605,196	589,128	193,146
1928	446,421	442,227	66,166	68,764	22,691	32,905	649,674	667,027	122,828
1929	561,454	466,475	105,138	62,389	73,276	36,768	863,410	785,475	228,572
1930	488,343	375,980	200,998	56,035	118,297	45,179	821,815	684,993	366,034
1931									
January	37,098	28,557	209,487	56,188	124,336	48,306	65,714	49,620	382,129
February	36,645	28,797	212,834	63,680	126,874	48,164	65,719	59,970	387,872
March	40,338	32,788	218,317	63,133	133,013	48,300	71,218	59,980	399,630
April	46,648	33,321	228,383	56,700	138,144	44,857	63,395	51,200	411,384
May	31,720	37,817	220,799	73,564	138,945	43,212	68,628	63,190	402,936
June	45,776	37,916	225,536	69,421	136,233	46,573	62,090	64,050	409,132
July	41,004	31,937	234,822	66,873	135,916	50,021	66,600	58,240	420,759
August	38,370	27,586	240,817	61,469	136,956	48,010	65,392	54,750	425,782
September	40,505	23,638	254,324	62,420	134,556	46,068	66,529	57,200	436,363
October	41,395	22,277	273,456	68,427	133,494	51,122	71,511	50,490	458,134
November	43,733	22,943	292,493	77,443	130,144	45,517	71,313	52,750	468,162
December	51,931	21,409	322,826	53,940	.....	.....	.....	.....	.....

*Including liquid latex, but not guayule. †Stocks on hand the last of the month or year. ‡W. H. Rickinson & Son's figures. §Stocks at the 3 main centers, U. S. A., U. K., Singapore and Penang.

Low and High New York Spot Prices

Plantations	January 1932*	January 1931	January 1930
Thin latex crepe	$0.04¾ @ $0.05⅛	$0.08⅛ @ $0.08⅞	$0.15 @ $0.16⅝
Smoked sheet, ribbed	.04¼ @ .04¾	.07⅞ @ .08½	.14¾ @ .15¾
Paras			
Upriver fine	.05½ @ .05¾	Nominal	.15¼ @ .16⅝
Upriver coarse	Nominal	.08 @	.08⅛ @ .08½
Upper caucho ball	Nominal	.08 @	.08 @ .08½

*Figured to January 26, 1932.

Rubber Scrap

THE scrap rubber market is dormant. January is not usually an active month in the first place; then consumption has been falling off for some time so that between the 2 factors, there is not much doing. Collections of scrap, also, are very low. The level of prices is such that collectors are not willing to go to the trouble of assembling scrap.

BOOTS AND SHOES. These are practically the only items on the list which are showing a fairly good demand. The activity is not yet reflected in prices, but quotations are generally considered to be at rock bottom; so a change for the better may be expected in the next few months.

INNER TUBES. The No. 1 floating tubes are the only ones in this group to show a change in price. They were quoted at 3½ to 3¾, against quotations which were ¼-cent lower last month. Collections are being made at a loss, and so are very light.

TIRES. Tire sales are in fair volume; so collections are being made in fair volume, too. Consumption is largely in the local market because the additional expense required to ship them out of this section would erase the profit.

A peculiar situation exists with solids, the export demand, of which especially, is very good. But with trucks and busses generally switching to pneumatic tires it is difficult to find enough scrap in solids to meet the demand. In contrast with last month, prices of tires held their own, with only a slight revision in mixed auto tires with beads. Instead of $8 to $8.50 a ton, they are now from $8 to $8.25 a ton.

MECHANICALS. The demand is fair for mechanical grades, and prices did not change from the levels of a month ago.

HARD RUBBER. Last month's price was maintained, with the demand good.

The market as a whole made a good showing for January. One increase in price offset a downward revision, and all other prices held their own.

CONSUMERS' BUYING PRICES

Carload Lots

Delivered Eastern Mills

January 26, 1932

	Prices
Boots and Shoes	
Boots and shoes, black, 100 lb.	$ .75 /$1.00
Colored, 100 lb.	.625 / .75
Untrimmed arctics, 100 lb.	.625 / .75
Tennis shoes and soles, 100 lb.	.50 / .60
Inner Tubes	
No. 1, floating, lb.	.03½ / .03¾
No. 2, compound, lb.	.01½ / .01⅝
Red, lb.	.01⅜ / .01½
Mixed tubes, lb.	.01½ / .01⅝
Tires	
Pneumatic Standard	
Mixed auto tires with beads, ton	8.00 / 8.25
Beadless, ton	12.00 /12.50
Auto tire carcass, ton	12.00 /12.50
Black auto peelings, ton	19.50 /20.00
Solid	
Clean mixed truck, ton	24.00 /26.00
Light gravity, ton	30.00 /31.00
Mechanicals	
Mixed black scrap, lb.	.00⅝ / .00¾
Hose, air brake, ton	8.00 / 9.00
Garden, rubber covered, lb.	.00⅜ / .00½
Steam and water, soft, lb.	.00⅜ / .00½
No. 1 red, lb.	.01¼ / .01⅜
No. 2 red, lb.	.01 / .01⅛
White druggists' sundries, lb.	.01½ / .01¾
Mechanical, lb.	.01 / .01⅛
Hard Rubber	
No. 1 hard rubber, lb.	.08¾ / .09

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Imports by Customs Districts

Crude rubber including latex dry rubber content

	November, 1931		November, 1930	
	Pounds	Value	Pounds	Value
Massachusetts	4,265,123	$205,779	2,640,874	$211,175
Buffalo	.....	.....	44,800	3,024
New York	82,933,775	3,995,960	59,972,336	5,170,960
Maryland	4,206,674	164,290	302,575	28,826
Virginia	671,990	31,586	.....	.....
Georgia	168,489	6,518	448,050	34,152
Mobile	799,680	36,226	.....	.....
Los Angeles	7,539,549	318,789	1,857,777	187,875
San Francisco	89,600	3,497	93,474	11,788
Oregon	.....	.....	11,200	1,037
Ohio	47,218	3,063	346,400	33,879
Colorado	308,000	17,159	884,800	82,635
Totals	101,030,098	$4,782,867	66,602,286	$5,765,351

British Malaya

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Charing Cross, London, S.W.1, England, gives the following figures for December, 1931:

Rubber Exports

Ocean Shipments from Singapore, Penang, Malacca, and Port Swettenham

	December, 1931	
To	Sheet and Crepe Rubber Tons	Latex Concentrated Latex and Revertex Tons
United Kingdom	6,041	137
United States	17,754	106
Continent of Europe	5,994	87
British possessions	732	1
Japan	4,074	5
Other countries	810	...
Totals	35,405	336

Rubber Imports

Actual Imports by Land and Sea

	December, 1931	
From	Dry Rubber Tons	Wet Rubber Tons
Sumatra	571	4,800
Dutch Borneo	594	2,798
Java and other Dutch Islands	68	17
Sarawak	1,070	45
British Borneo	242	23
Burma	319	11
Siam	125	162
French Indo China	387	21
Other countries	55	6
Totals	3,431	7,883

World Rubber Shipments—Net Exports

Long Tons

	Calendar Years		1931			
	1929	1930	Sept.	Oct.	Nov.	Dec.
British Malaya						
Gross exports	579,524	547,043	44,336	45,911	48,012	35,741
Imports	161,612	133,876	8,369	9,955	9,529	11,314
Net	417,912	413,167	35,967	35,956	38,483	24,427
Ceylon	80,795	70,406	4,029	5,544	*4,858	*6,895
India and Burma	11,720	10,782	169	286	408	.....
Sarawak	11,079	10,310	701	872	830	.....
British No. Borneo	7,381	7,052	*500	*500	*500	*500
Siam	5,024	4,349	218	338	390	.....
Java and Madura	66,010	69,755	5,578	8,086	7,351	.....
Sumatra E. Coast	87,589	79,396	7,358	7,882	8,174	.....
Other N. E. Indies	134,732	115,254	8,389	9,547	7,981	.....
French Indo-China	10,147	9,877	917	934	*944	*1,550
Amazon Valley	21,148	14,260	745	1,284	872	836
Other America	996	516	.....	.....	.....	.....
Guayule	1,275	1,095	...	...	...	.....
Africa	4,596	3,961	*170	*150	*150	*150
Totals	860,404	816,180	64,741	71,379	70,941	.....

*Estimate. *Compiled by Rubber Division, Department of Commerce.*

World Rubber Absorption—Net Imports

Long Tons

	Calendar Years		1931		
	1929	1930	Sept.	Oct.	Nov.
CONSUMPTION					
United States	472,000	376,107	23,845	22,473	23,145
United Kingdom	72,023	74,760	8,152	6,559	5,901
NET IMPORTS					
Australia	15,886	5,354	269	765	934
Austria	3,324	2,365	58	†33	699
Belgium	9,445	10,740	1,015	792	.....
Canada	35,453	28,793	1,535	1,567	1,233
Czechoslovakia	4,650	4,532	499	695	.....
Denmark	799	1,147	65	84	99
Finland	976	1,262	154	127	67
France	59,342	68,503	4,420	3,909	2,669
Germany	49,078	45,488	4,227	3,220	.....
Italy	17,169	18,570	693	571	545
Japan	34,284	32,731	5,556	3,980	.....
Netherlands	3,022	2,924	191	185	183
Norway	813	1,143	53	66	132
Russia	12,626	16,229	2,335	4,076	.....
Spain	2,400	2,400	99	193	297
Sweden	3,857	4,414	299	433	447
Switzerland	653	808	83	66	77
Others estimated†	7,000	7,200	*800	*800	*800
Totals	804,800	705,470	54,348	50,594	.....
Minus United States (Cons.)	472,000	376,107	23,845	22,473	23,145
Total foreign	332,800	329,363	30,503	28,121	.....

*Estimate to complete table. †Indicating excess of reexports over imports. *Compiled by Rubber Division, Department of Commerce, Washington, D. C.*

Tire Production Statistics

Pneumatic Casings—All Types

	Inventory	Production	Total Shipments
1929	9,470,368	54,980,672	55,515,884
1930	7,202,750	40,772,378	42,913,108
1931			
January	7,165,846	2,939,702	2,995,479
February	7,628,520	3,188,274	2,721,347
March	8,011,592	3,730,061	3,297,225
April	8,025,135	3,955,491	3,945,525
May	8,249,856	4,543,003	4,332,137
June	8,357,768	4,537,970	4,457,509
July	7,935,565	3,941,187	4,369,526
August	7,117,037	3,124,746	3,967,987
September	6,526,762	2,537,575	3,145,488
October	6,640,052	2,379,004	2,261,322
November	6,335,227	2,000,630	2,309,971

Solid and Cushion Tires

	Inventory	Production	Total Shipments
1929	122,200	407,347	436,027
1930	75,871	204,340	250,635
1931			
January	75,205	12,631	13,072
February	73,338	11,358	12,915
March	68,584	11,424	16,152
April	64,369	11,610	15,445
May	61,272	11,369	15,566
June	57,462	11,764	15,364
July	54,692	13,370	16,051
August	50,994	11,643	15,758
September	45,995	10,371	12,786
October	42,861	11,132	13,621
November	42,074	9,317	10,120

Inner Tubes—All Types

	Inventory	Production	Total Shipments
1929	10,245,365	55,062,886	56,473,303
1930	7,999,477	41,936,029	43,952,139
1931			
January	7,551,503	2,898,405	3,249,734
February	7,936,773	3,132,770	2,720,135
March	8,379,974	3,559,644	3,031,279
April	8,330,155	3,693,222	3,708,949
May	8,438,799	4,329,731	4,224,594
June	8,403,401	4,286,467	4,317,543
July	7,671,801	3,964,174	4,664,964
August	7,019,217	3,548,335	4,240,403
September	6,476,191	2,759,431	3,320,103
October	6,656,913	2,461,578	2,250,494
November	6,495,708	1,954,915	2,075,716

	Cotton and Rubber Consumption Casings, Tubes, Solid and Cushion Tires		Consumption of Motor Gasoline (100%)
	Cotton Fabric Pounds	Crude Rubber Pounds	Gallons
1929	208,824,653	598,994,708	14,748,552,000
1930	158,812,462	476,755,707	16,200,894,000
1931			
January	12,738,467	36,318,980	1,127,532,000
February	12,002,161	36,651,119	1,097,208,000
March	14,040,803	41,850,638	1,303,302,000
April	15,243,625	45,016,344	1,402,800,000
May	18,009,764	53,417,709	1,499,904,000
June	17,084,749	51,279,827	1,611,540,000
July	15,139,769	46,696,925	1,657,446,000
August	11,745,425	36,231,633	1,657,278,000
September	9,584,509	29,854,183	1,543,500,000
October	9,262,999	28,371,957	1,472,142,000
November	8,360,534	25,921,535	1,286,880,000

Rubber Manufacturers Association figures representing 80 per cent of the industry since January, 1929, with the exception of gasoline consumption.

CLASSIFIED ADVERTISEMENTS

SITUATIONS WANTED

YOUNG MAN, TWENTY-SEVEN, ASSISTANT SUPERINTENDENT or junior executive, six years' experience production, factory development and research with large corporations, tires, tubes, sundries, packings, brake linings. Knowledge compounding. Moderate salary. Fine record and references. Address Box No. 11,086, care of INDIA RUBBER WORLD.

RUBBER CHEMIST, AGE THIRTY-SEVEN, SINGLE, FIFTEEN years' varied experience in the analysis, compounding, control, testing and reclaiming of rubber goods, is available for any suitable position. Address Box No. 11,088, care of INDIA RUBBER WORLD.

FACTORY SUPERINTENDENT OR DEPARTMENT SUPERINtendent: Practical man, with years of experience in rubberizing of all kinds of fabrics both single and double textures, quarter lining, calender, mill room, spreading, curing, and compounding. Thoroughly understands the working of all equipment. Will accept moderate salary to start where good future is offered. Will go anywhere. Address Box No. 11,094, care of INDIA RUBBER WORLD.

ACCOUNTANT SEEKS POSITION WITH A PROGRESSIVE RUBber company. Several years' experience with large concerns as chief accountant and office manager. Now employed. Present location New York City. Address Box No. 11,096, care of INDIA RUBBER WORLD.

RUBBER CHEMIST AND TECHNOLOGIST, 8 YEARS' LABORAtory and factory experience. Compounding, development work, and technical supervision of manufacture of hose, tapes, tubings, miscellaneous molded parts, rubber gloves, etc. Best of references. Address Box No. 11,097, care of INDIA RUBBER WORLD.

GOLF BALL EXPERT, THOROUGH TECHNICAL AND PRACtical knowledge of modern production methods. Have had actual experience in development and production of balls of proven merit. Desire connection with progressive organization. Address Box No. 11,098, care of INDIA RUBBER WORLD.

AVAILABLE IMMEDIATELY: RUBBER EXECUTIVE, 17 YEARS' experience technical, production, sales in mechanicals, footwear, sundries, toys, and golf balls. Address Box No. 11,099, care of INDIA RUBBER WORLD.

POSITION WANTED: CHEMICAL ENGINEER, EXPERIENCED in the production, buying, compounding, and costing, in the manufacture of golf-ball thread and textile rubber thread. Address Box No. 12,001, care of INDIA RUBBER WORLD.

FACTORY MANAGER OR SUPERINTENDENT: TECHNICALLY schooled, fifteen years' actual managerial experience, absolutely familiar with costs, purchasing, compounding, and latest methods of production in manufacture of belting of all types, wrapped hose, fabric or wire types, molded garden hose, miscellaneous molded goods, fire hose, heels, soles, and hard rubber goods. Reputed excellent handler of men. Address Box No. 12,002, care of INDIA RUBBER WORLD.

SITUATIONS OPEN

WANTED: TIRE DEPARTMENT FOREMAN. MUST BE THORoughly experienced in the most advanced ideas of tire construction. Capable of supervising bead building and stock preparation. Knowledge of airbag building and curing tires advantageous. Must be a hustler and have plenty of initiative. Write fully, stating age, references, and lowest salary acceptable to start. Address Box No. 11,089, care of INDIA RUBBER WORLD.

SITUATIONS OPEN—Continued

FOREMAN REQUIRED

to manufacture RUBBER BOOTS in France. State terms, experience, references, and also cost machinery required. Write Box ZH275, c/o Deacon's Advertising Agency, Fenchurch-Avenue, London, England.

WANTED: FOREMAN FOR DEPARTMENT PRODUCING AUTO topping, leatherette, hospital sheeting, and jersey cloth. Must have practical experience in these lines, be capable of assuming full charge of spreading, calendering, curing and finishing, and produce with a minimum of waste. Address Box No. 11,092, care of INDIA RUBBER WORLD.

WANTED: MAN WHO IS FAMILIAR WITH RUNNING DIFFERent kinds of stock on National-Erie tubing machine, motor driven, gear reduction. Give experience. Address Box No. 11,095, care of INDIA RUBBER WORLD.

EDITORIAL WRITER, EXPERIENCED IN THE FUNDAMENTALS of rubber compounding, processes and machinery; state age, qualifications, salary, for part or whole time. Address Box No. 12,003, care of INDIA RUBBER WORLD.

BUSINESS OPPORTUNITIES

WANTED TO CONNECT WITH A SMALL RUBBER FACTORY capable of milling, calendering, and tubing stock in the vicinity of New Jersey. Address Box No. 11,093, care of INDIA RUBBER WORLD.

GENERAL MANAGER CAN BRING PROFITABLE LINE TO small, well financed rubber plant. Address Box No. 12,000, care of INDIA RUBBER WORLD.

WANTED TO BUY OR RENT: A SMALL RUBBER FACTORY, with a large 60-inch calender, one or two mills. Address Box No. 12,004, care of INDIA RUBBER WORLD.

CANADA Are you losing your Canadian business through the new high import duties? Canadian manufacturer is open to negotiate a working arrangement to manufacture tires, mechanical, sponge, and other rubber goods for the Canadian and export trade.

Address
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41 Park Row, NEW YORK, N. Y.
SOLE PRODUCERS
ASBESTINE
REG. U. S. PAT. OFF.

MECHANICAL MOLDED RUBBER GOODS
We Solicit Your Inquiries
THE BARR RUBBER PRODUCTS COMPANY
SANDUSKY, OHIO

Just tell them what you can do

The main thing is TO BE HERE, REGULARLY, to make your facilities clear, to tell enough to develop the confidence that acquires orders. Rates are low. Results speak for themselves.

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(Highly Concentrated [About 73%] Rubber Latex)
SOLE DISTRIBUTORS FOR U. S. A. AND CANADA:
Revertex Corp. of America
40 RECTOR STREET NEW YORK, N. Y.

(*Advertisements continued on page* 107)

United States Statistics

Imports of Crude and Manufactured Rubber

	October, 1931		Ten Months Ended October, 1931	
UNMANUFACTURED—*Free*	Pounds	Value	Pounds	Value
Crude rubber	92,133,693	$4,803,582	893,231,493	$62,566,602
Liquid latex	598,575	43,238	9,190,362	801,935
Jelutong or pontianak	930,477	75,219	10,882,598	906,291
Balata	223,731	13,846	2,416,415	362,338
Gutta percha	.....	.....	261,879	31,462
Guayule	.....	.....	.....	.....
Siak, scrap, and reclaimed	1,178,855	16,599	7,916,574	83,643
Totals	95,065,331	$4,952,484	923,899,321	$64,752,271
Chicle, crude *Free*	369,490	$175,636	7,283,409	$3,431,989
MANUFACTURED—*Dutiable*				
Tires *number*	6,142	$13,957	30,536	$73,438
Other rubber manufactures	.....	101,185	.....	733,260
Totals	.....	$115,142	.....	$806,698

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber	3,534,897	$204,079	48,510,596	$3,721,279
Balata	6,516	1,650	98,396	25,578
Guayule	.....	.....	31,400	4,398
Gutta percha, rubber substitutes, and scrap	131	79	12,653	2,133
Rubber manufactures	.....	5,949	.....	24,414
Totals	.....	$211,757	.....	$3,777,802

Exports of Domestic Merchandise

RUBBER AND MANUFACTURES				
Reclaimed	1,502,458	$68,127	13,706,094	$642,096
Scrap and old	3,508,577	63,759	42,525,693	941,373
Rubberized automobile cloth, *sq. yd.*	73,786	31,219	796,306	351,068
Other rubberized piece goods and hospital sheeting, *sq. yd.*	93,178	34,733	1,015,503	410,488
Footwear				
Boots *pairs*	103,258	185,970	596,200	1,325,847
Shoes *pairs*	114,588	128,116	797,621	656,271
Canvas shoes with rubber soles *pairs*	47,505	29,098	1,344,289	845,757
Soles *doz. pairs*	7,797	19,171	77,119	198,656
Heels *doz. pairs*	62,635	37,906	644,572	416,649
Water bottles and fountain syringes *number*	52,635	27,348	342,436	159,452
Gloves *doz. pairs*	5,808	14,495	77,286	191,275
Other druggists' sundries	.....	35,631	.....	278,865
Balloons *gross*	82,202	79,209	561,927	513,268
Toys and balls	.....	5,718	.....	100,956
Bathing caps *doz.*	1,263	2,757	110,461	215,646
Bands	42,973	14,054	401,831	145,694
Erasers	34,494	20,421	351,221	210,299
Hard rubber goods				
Electrical goods	128,646	11,729	1,100,640	120,640
Other goods	.....	16,028	.....	198,951
Tires				
Truck and bus casings, *number*	35,215	576,045	340,450	6,673,382
Other automobile casings, *number*	85,561	690,994	1,230,016	9,404,970
Tubes, auto *number*	79,183	104,730	1,024,185	1,380,571
Other casings and tubes, *number*	4,365	9,553	72,016	153,491
Solid tires for automobiles and motor trucks *number*	904	26,019	10,346	330,346
Other solid tires	138,022	16,777	1,354,039	182,239
Tire sundries and repair materials	.....	69,687	.....	720,677
Rubber and friction tape	109,199	24,875	976,901	260,304
Belting	240,610	97,969	2,856,390	1,240,608
Hose	369,557	96,350	4,201,622	1,230,842
Packing	124,744	44,666	1,133,570	462,504
Thread	112,066	69,963	1,260,506	999,054
Other rubber manufactures	.....	121,502	.....	1,400,820
Totals	.....	$2,774,619	.....	$32,363,059

London Stocks, November, 1931

	Landed Tons	Delivered Tons	Stocks November 30 1931 Tons	1930 Tons	1929 Tons
LONDON					
Plantation	3,205	6,045	73,877	76,778	52,316
Other grades	.....	1	34	54	55
LIVERPOOL					
Plantation	*1,433	*1,942	*56,233	*39,718	*17,655
Total tons, London and Liverpool	4,638	7,988	130,144	116,550	70,026

*Official returns from the recognized public warehouses.

United Kingdom Statistics

Imports

	November, 1931		Eleven Months Ended November, 1931	
UNMANUFACTURED				
Crude Rubber				
From	Pounds	Value	Pounds	Value
Straits Settlements	4,949,900	£60,942	123,610,400	£1,775,429
Federated Malay States	1,763,000	30,592	54,304,500	842,537
British India	488,700	5,729	11,138,200	162,205
Ceylon and Dependencies	1,172,200	15,027	21,243,000	317,507
Java and Dutch Borneo	1,378,100	17,449	26,680,100	401,607
Sumatra and other Dutch possessions in Indian Seas	1,065,200	14,593	14,218,300	218,399
Other countries in East Indies and Pacific, not elsewhere specified	189,100	2,558	3,491,100	52,928
Brazil	578,800	7,273	4,944,500	87,853
South and Central America (except Brazil)	11,200	140	53,600	735
West Africa				
French West and Equatorial Africa	.....	.....	29,900	548
Gold Coast	.....	.....	175,500	2,666
Other parts of West Africa	256,700	3,207	1,859,300	27,094
East Africa, including Madagascar	.....	.....	184,500	2,940
Other countries	163,200	2,736	1,195,900	21,259
Totals	12,016,100	£160,246	263,128,800	£3,913,707
Gutta percha and balata	363,100	20,833	2,915,700	195,626
Waste and reclaimed rubber	681,900	8,222	7,211,500	69,789
Rubber substitutes, synthetic	600	20	16,500	436
Totals	13,061,700	£189,321	273,272,500	£4,179,558
MANUFACTURED				
*Tires and tubes				
Pneumatic				
Outer covers	.....	£27,003	.....	£215,656
Inner tubes	.....	12,770	.....	74,579
Solid tires	.....	4,280	.....	38,054
Boots and shoes *doz. pairs*	62,775	130,875	1,117,879	1,465,495
Other rubber manufactures	.....	220,397	.....	1,747,943
Totals	.....	£395,325	.....	£3,541,727

Exports

UNMANUFACTURED				
Waste and reclaimed rubber	1,630,600	£9,325	13,882,900	£85,437
Rubber substitutes, synthetic	35,100	671	413,000	7,973
Totals	1,665,700	£9,996	14,295,900	£93,410
MANUFACTURED				
Tires and tubes				
Pneumatic				
Outer covers	.....	£224,693	.....	£2,651,656
Inner tubes	.....	21,183	.....	314,965
Solid tires	.....	4,328	.....	51,003
Boots and shoes *doz. pairs*	7,244	15,406	160,460	217,769
Other rubber manufactures	.....	138,772	.....	1,770,118
Totals	.....	£404,382	.....	£5,005,511

Exports—Colonial and Foreign

UNMANUFACTURED				
Crude Rubber				
To				
Soviet Union (Russia)	3,590,500	£75,277	29,442,500	£647,425
Sweden, Norway, and Denmark	349,200	6,303	2,302,900	44,947
Germany	763,300	11,540	17,196,200	271,506
Belgium	329,000	5,694	8,897,800	146,040
France	495,900	9,481	13,214,600	239,111
Spain	120,200	2,659	1,073,900	28,076
Italy	152,500	3,932	3,271,500	55,187
Other European countries	289,700	5,160	3,246,000	72,101
United States	74,400	1,657	2,041,300	44,752
Other countries	138,400	2,913	1,519,100	35,771
Totals	6,303,100	£124,616	82,205,800	£1,584,916
Gutta percha and balata	37,600	2,783	481,800	41,503
Waste and reclaimed rubber	4,400	88	174,300	2,537
Rubber substitutes, synthetic	.....	.....	1,400	18
Totals	6,345,100	£127,487	82,863,300	£1,628,974
MANUFACTURED				
Tires and tubes				
Pneumatic				
Outer covers	.....	£5,829	.....	£66,612
Inner tubes	.....	399	.....	3,825
Solid tires	.....	.....	.....	215
Boots and shoes *doz. pairs*	1,868	4,698	26,592	39,745
Other rubber manufactures	.....	3,701	.....	54,538
Totals	.....	£14,627	.....	£164,935

* Motor cars, motorcycles, parts and accessories, were liable to duty from Sept. 29, 1915, until Aug. 1, 1924, inclusive, and after July 1, 1925. Commercial vehicles, parts, and accessories were exempt from duty until Apr. 30, 1926, inclusive, and tires and tubes until Apr. 11, 1927, inclusive.

Classified Advertisements

CONTINUED

MACHINERY AND SUPPLIES FOR SALE

DEVINE 17 SHELF VACUUM DRIER, NO. 11, CONDENSER AND pump. Will sacrifice. Address Box No. 12,005, care of INDIA RUBBER WORLD.

MACHINERY AND SUPPLIES WANTED

WE ARE IN THE MARKET FOR A 66-INCH CALENDER, SEVERAL individual 60-inch mills, balloon tire and airbag molds, and all equipment necessary for a tire unit. Machines must be in first-class condition and you must quote lowest prices. Address Box No. 11,090, care of INDIA RUBBER WORLD.

WANTED: COMPLETE SET OF BALLOON TIRE AND AIRBAG molds. Must have modern non-skid design and be modern in regard to producing a tire along with up-to-date ideas of tire engineering. Complete set of blue-prints must be furnished and sample of tire from molds if possible. Must be in first-class condition and cheap. Address Box No. 11,091, care of INDIA RUBBER WORLD.

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Medford, Mass.

The Franz Foundry & Machine Co.
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MOLDS, CORES AND RUBBER MACHINERY
HEATER PRESSES, ENGRAVING MACHINES
WATCH CASE HEATERS, RETREAD EQUIPMENT

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GUARANTEED REBUILT MACHINERY
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MILLS—6"x12", 12"x24", 16"x36", 16"x42", 18"x50", 20"x22"x60", 22"x72", 24"x26"x84" Farrel, Thropp, Vaughn, Allen, W.S.M., Birmingham.
CALENDERS—100", 66", 60", 54", 48", 30", 24", in 2, 3, 4-Roll Farrel, Adamson, Vaughn.
TUBERS—Nos. 1, 2, 3, 4, Royle Perfected.
STRAINERS—6", 8", 10" Allen, Adamson, etc.
HYDRAULIC PRESSES—14"x14" (Ten Platens), 24"x24", 30"x30", 36"x36", 34"x34" (Seven Platens), 40"x40", 44"x44", 48"x48", etc.
MIXERS—4-100 gallon W.P. Mixers; 2-100 gallon Day Mixers, 50, 75, 200 gal.; other makes, Jacketed and Unjacketed.
PUMPS—High and low pressure Triplex, all sizes.
AIR COMPRESSORS—Ingersoll-Rand, Belt and Steam.
SLITTERS—Cameron, 50" and 60"; 64" Spadone Bias Cutter.
VULCANIZERS—Allen 5'x12' Quick Opening; 6'x24', 5'x40' Southwark, Birmingham.
REFINERS—14"x18"x24", 18"x22"x32", Farrel, Allen.
CRACKERS—16"x24", 16"x30" 16"x36" Birmingham.
TIRE EQUIPMENT—Banner Machines, Vertical Heaters, Molds, etc.
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RE-BUILT AND NEW RUBBER MILL MACHINERY OF EVERY TYPE
GUARANTEED EQUIPMENT—PROMPT SHIPMENT
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Calenders	Washers	Pumps	Bias Cutters	Driers
Hydraulic Presses	Crackers	Accumulators	Banbury Mixers	Slitters, etc.

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Great Britain Representative
FRANCIS PAISLEY
76 Maryon Road
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Plantation Rubber Crop Returns by Months

Summary of 615 Producing Companies

1931	Br. N. Borneo (26 Companies) Long Tons	Index	Ceylon (102 Companies) Long Tons	Index	India and Burma (21 Companies) Long Tons	Index	Malaya (338 Companies) Long Tons	Index	Netherlands East Indies—Java (60 Companies) Long Tons	Index	Netherlands East Indies—Sumatra (60 Companies) Long Tons	Index	Miscellaneous (8 Companies) Long Tons	Index	Total (615 Companies) Long Tons	Index
January	473	96.7	1,776	87.0	397	70.6	13,006	104.6	3,020	115.0	4,324	107.2	225	124.3	23,221	103.8
February	365	74.6	1,138	55.8	160	28.5	11,551	92.9	2,631	100.2	3,721	92.3	130	71.8	19,696	88.1
March	378	77.3	1,065	52.2	510	90.7	11,439	92.0	3,174	120.9	4,173	103.5	182	100.6	20,921	93.6
April	351	71.8	1,699	83.2	672	119.6	10,423	83.8	3,069	116.9	3,726	92.4	208	114.9	20,148	90.1
May	428	87.5	1,340	65.7	655	116.5	11,669	93.8	3,235	123.2	4,076	101.1	207	114.4	21,610	96.6
June	411	84.0	888	43.5	232	41.3	11,752	94.5	3,043	115.9	4,224	104.8	208	114.9	20,758	92.8
July	403	82.4	1,234	60.5	213	37.9	13,249	106.6	3,042	115.8	4,476	111.0	213	117.7	22,830	102.1
August	410	83.8	1,137	55.7	108	19.2	13,081	105.2	2,340	89.1	4,563	113.2	209	115.5	21,848	97.7
September	352	72.0	1,309	64.1	283	50.4	12,685	102.0	2,368	90.2	4,515	112.0	187	103.3	21,699	97.0
October	364	74.4	1,538	75.4	339	60.3	13,301	107.0	2,730	104.0	4,751	117.8	206	113.8	23,229	103.9
November	368	75.3	1,393	68.3	340	60.5	13,105	105.4	2,886	109.9	4,671	115.8	205	113.3	22,968	102.7
December	379	77.5	1,482	72.6	355	63.2	13,207	106.2	3,023	115.1	4,735	117.4	208	114.9	23,389	104.6
Twelve months ending December, 1931	4,682	....	15,999	....	4,264	....	148,468	....	34,561	....	51,955	....	2,388	....	262,317	....
1930	5,586	....	23,124	....	6,799	....	147,737	....	31,838	....	47,759	....	2,326	....	265,169	....
1929	5,868	....	24,489	....	6,737	....	149,202	....	31,510	....	48,382	....	2,169	....	268,357	....

NOTE. Index figures throughout are based on the monthly average for 1929=100. Issued January 11, 1932, by the Commercial Research Department, The Rubber Growers' Association, Inc., London, England.

Rubber Goods Production Statistics

	1931 Nov.	Oct.	Sept.	Aug.	July	June	May	Apr.	Mar.	Feb.	Jan.	1930 Dec.	Nov.
TIRES AND TUBES													
Pneumatic casings													
Production ..... thousands	....	2,379	2,538	3,125	3,941	4,538	4,543	3,955	3,730	3,188	2,940	2,251	2,123
Shipments													
Domestic ..... thousands	....	2,185	3,034	3,845	4,244	4,320	4,197	3,804	3,143	2,580	2,855	2,550	2,119
Exports ..... thousands		96	111	123	125	137	135	142	155	142	140	139	148
Stocks, end of month ..... thousands	..	6,640	6,527	7,117	7,936	8,358	8,250	8,025	8,012	7,629	7,166	7,203	7,676
Solid and cushion tires													
Production ..... thousands		11	10	12	13	12	11	12	11	11	13	13	13
Shipments													
Domestic ..... thousands		13	12	15	15	14	14	14	15	12	12	12	13
Exports ..... thousands		1	1	1	1	1	1	1	1	1	1	1	1
Stocks, end of month ..... thousands		43	46	51	55	57	61	64	69	73	75	76	76
Inner tubes													
Production ..... thousands		2,462	2,759	3,548	3,964	4,286	4,330	3,693	3,560	3,133	2,898	2,448	2,144
Shipments													
Domestic ..... thousands	....	2,187	3,247	4,158	4,569	4,228	4,135	3,610	2,922	2,619	3,147	2,634	2,147
Exports ..... thousands	..	63	73	82	96	89	89	99	109	101	102	96	84
Stocks, end of month ..... thousands	...	6,657	6,476	7,019	7,672	8,403	8,439	8,330	8,380	7,937	7,552	7,999	8,250
Raw material consumed													
Fabrics ..... thous. of lbs.	....	9,263	9,585	11,745	15,140	17,085	18,010	15,244	14,041	12,002	12,738	8,358	8,418
Crude rubber ..... thous. of lbs.	....	28,372	29,854	36,232	46,697	51,280	53,418	45,016	41,851	36,651	36,319	25,537	26,253
MISCELLANEOUS RUBBER PRODUCTS													
Calendered rubber clothing													
Net orders ..... no. coats and sundries	14,341	20,925	23,966	21,580	17,932	21,161	19,380	16,846	19,380	16,361	21,884	12,881	15,493
Production ..... no. coats and sundries	23,225	19,773	22,728	27,080	14,431	15,419	18,094	16,803	19,220	18,276	13,059	20,791	22,623
Mechanical rubber goods, shipments													
Belting ..... thous. of dollars	....	601	788	802	914	798	790	832	889	722	759	675	779
Hose ..... thous. of dollars	....	972	1,041	1,161	1,436	1,650	1,857	2,129	1,892	1,611	1,440	1,337	1,276
All other ..... thous. of dollars	....	1,105	1,186	1,393	1,356	1,431	1,584	1,656	1,631	1,378	1,400	1,326	1,345
Total ..... thous. of dollars	....	2,678	3,015	3,356	3,706	3,879	4,231	4,617	4,412	3,711	3,599	3,338	3,400
Rubber bands, shipments ..... thous. of lbs.	197	225	201	195	246	209	215	259	231	222	211	165	165
Rubber flooring, shipments .... thous. of sq. ft.	462	550	595	595	577	576	569	569	496	366	365	597	432
Rubber and canvas footwear													
Tennis													
Production ..... thous. of pairs	....	1,231	1,012	1,021	836	1,999	2,142	2,591	2,609	2,492	2,409	1,875	1,940
Shipments, domestic ..... thous. of pairs	....	589	1,263	1,223	1,520	2,657	3,316	4,049	3,107	2,688	2,377	871	319
Exports ..... thous. of pairs	..	44	72	29	125	100	121	150	236	200	110	175	148
Stocks ..... thous. of pairs	....	6,076	5,473	5,704	5,957	6,766	7,523	8,833	10,328	11,047	11,447	11,633	10,712
Waterproof, total													
Production ..... thous. of pairs	..	3,131	2,922	2,361	1,570	1,922	1,261	1,102	874	958	1,272	2,214	2,736
Shipments, domestic ..... thous. of pairs	....	4,318	4,185	2,842	1,510	1,229	626	1,070	944	1,015	1,549	3,888	4,212
Exports ..... thous. of pairs	....	153	186	151	117	108	50	72	53	92	74	63	135
Stocks ..... thous. of pairs	..	13,804	15,141	16,366	16,978	17,024	16,357	15,733	15,803	16,030	16,179	17,172	18,449
Grand total													
Production ..... thous. of pairs	....	4,363	3,934	3,382	2,407	3,921	3,402	3,693	3,483	3,450	3,681	4,089	4,675
Shipments, domestic ..... thous. of pairs	....	4,907	5,448	4,065	3,030	3,886	3,942	5,119	4,050	3,704	3,926	4,759	4,531
Exports ..... thous. of pairs	....	197	258	180	242	208	171	222	288	292	184	237	282
Stocks ..... thous. of pairs	....	19,880	20,615	22,070	22,935	23,789	23,881	24,566	26,130	27,077	27,627	28,806	29,160
Rubber heels													
Production ..... thous. of pairs	....	14,567	15,827	16,293	15,361	17,093	15,474	15,408	14,661	13,156	12,973	13,101	11,083
Shipments													
Exports ..... thous. of pairs		617	501	514	540	630	612	578	577	658	748	838	880
Repair trade ..... thous. of pairs	..	5,924	6,994	5,355	4,058	4,946	3,975	4,038	4,868	4,854	3,939	3,450	4,473
Shoe manufacturers ..... thous. of pairs		7,484	9,724	11,653	11,177	10,522	9,693	10,112	10,991	8,397	8,471	6,618	4,578
Stocks, end of month ..... thous. of pairs		24,652	23,952	25,832	27,006	27,898	28,491	27,764	26,708	29,335	30,302	29,741	29,130
Rubber-proofed fabrics, production													
Auto fabrics ..... thous. of yds.	394	445	528	596	531	701	982	710	738	644	577	476	532
Raincoat fabrics ..... thous. of yds.	1,267	2,476	2,988	2,226	1,843	1,355	1,066	1,040	863	567	738	697	1,426
All other ..... thous. of yds.	868	1,191	1,176	965	963	1,156	1,002	1,271	1,168	973	891	736	864
Total ..... thous. of yds.	2,529	4,112	4,692	3,787	3,337	3,212	3,050	3,381	2,769	2,184	2,206	1,909	2,822
Rubber soles													
Production ..... thous. of pairs	....	2,610	2,880	2,933	2,864	3,177	2,885	2,692	2,292	2,724	2,481	3,021	1,426
Shipments													
Exports ..... thous. of pairs	....	45	90	67	67	59	62	69	14	36	11	58	60
Repair trade ..... thous. of pairs	....	370	290	234	196	225	330	255	408	290	287	243	280
Shoe manufacturers ..... thous. of pairs	....	2,273	2,604	2,790	2,569	2,899	2,651	2,474	2,145	2,259	2,090	2,305	1,011
Stocks, end of month ..... thous. of pairs	....	2,153	2,264	2,395	2,475	2,461	2,655	2,764	2,876	3,167	3,032	2,917	2,390

Source: *Survey of Current Business*. Bureau of Foreign and Domestic Commerce. Washington, D. C.